

GRINNELL

CATALOGUE J.C.
1926

REPRINTED 1935

GRINNELL  COMPANY

OF CANADA, LIMITED

SALES OFFICES

**TORONTO
WINNIPEG**

**MONTREAL
VANCOUVER**

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OF CANADA, LIMITED

CATALOGUE J-C

*Wrought, Cast Iron and Brass Pipe.
Fittings, Valves, Pipe Hangers and
Supports, Piping Supplies, Etc.*

SEE CLASSIFICATION INDEX
ON INSIDE FRONT COVER

GENERAL OFFICES

Toronto, Ontario

SALES OFFICES

Toronto, Ont.,
2440 Dundas St., West

Montreal, Que.,
700 Beaumont Avenue

Winnipeg, Man.,
850 Somerset Building

Vancouver, B.C.,
1132 Hamilton Street

PLANTS AND WAREHOUSES

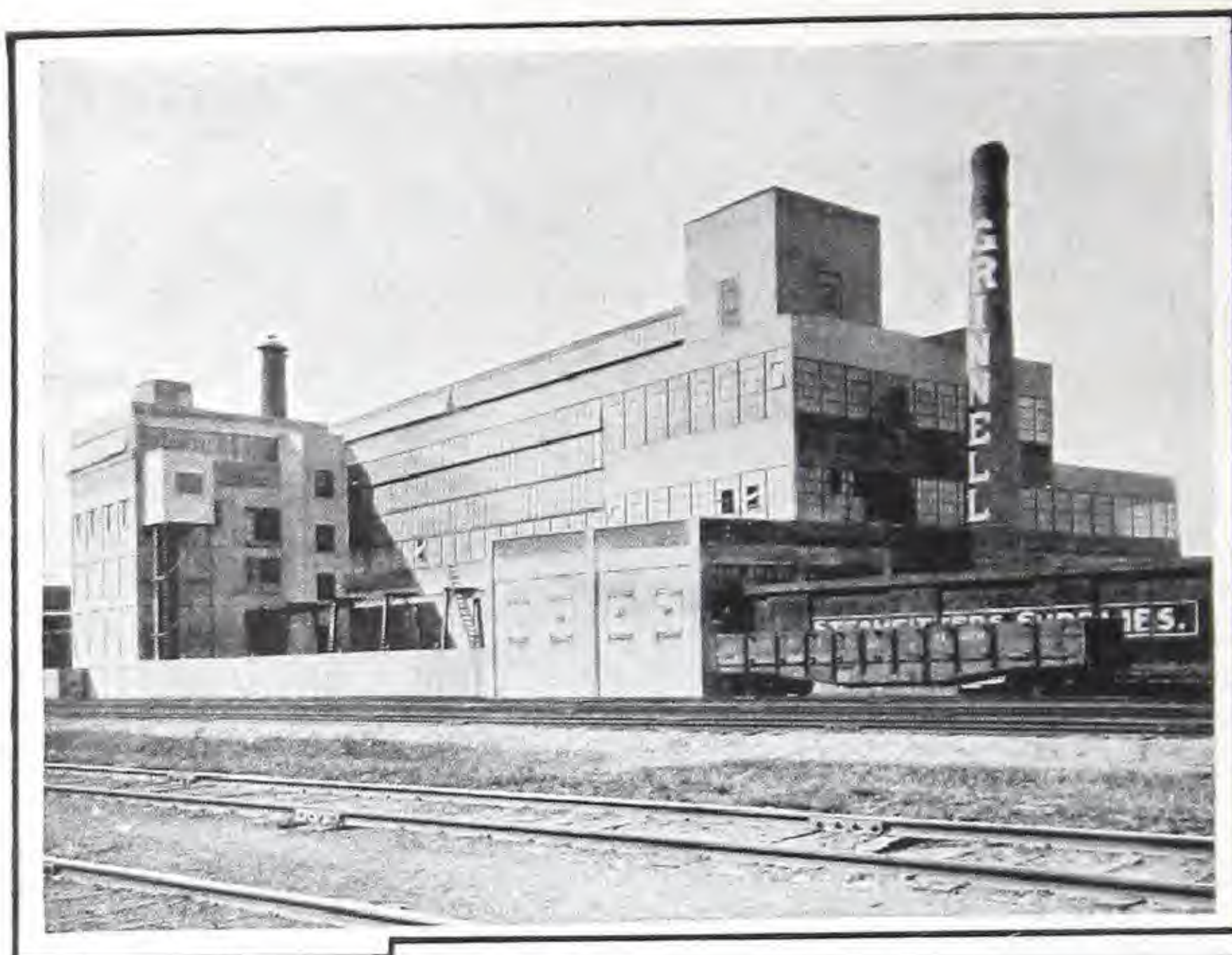
Toronto, Ont.

Vancouver, B.C.

Montreal, Que.

FOUNDRY

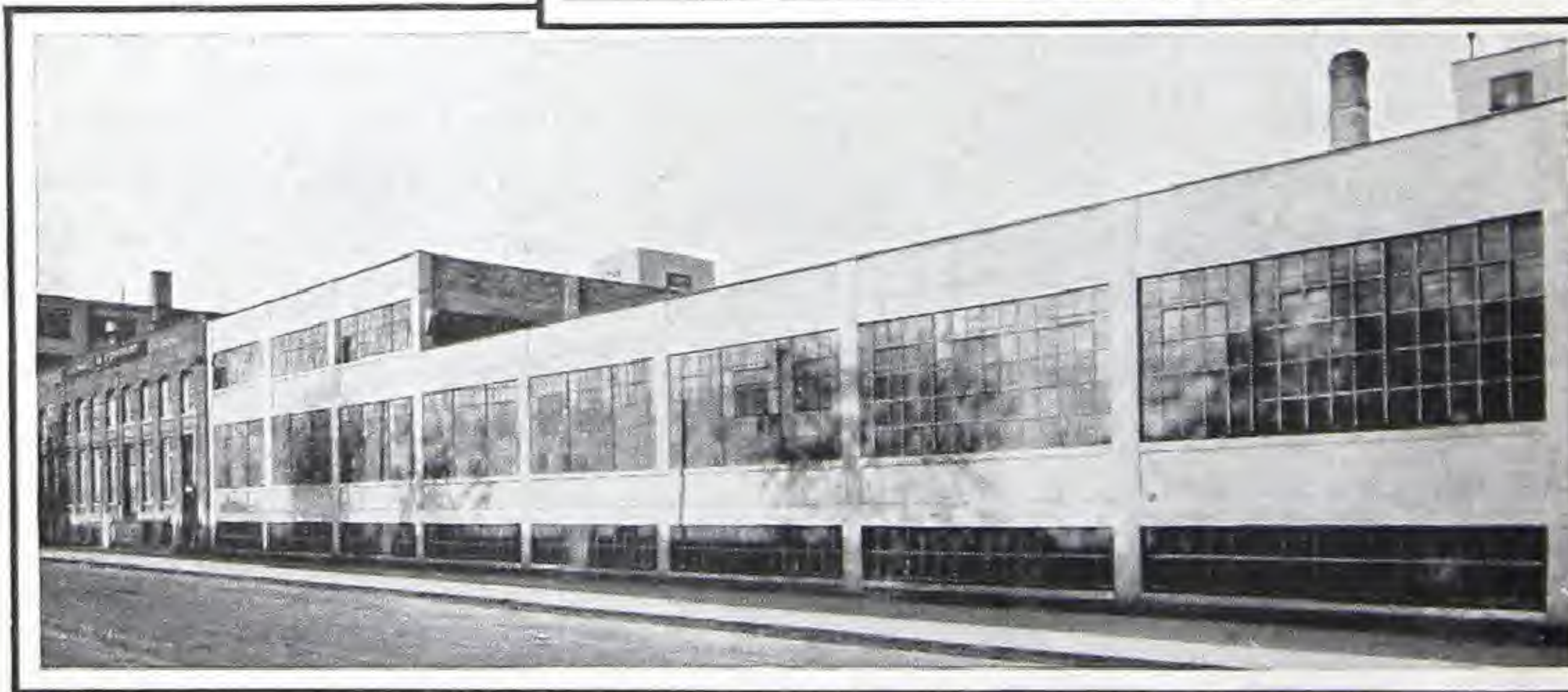
Toronto, Ont.



Above and at
Right —

Views of Grinnell
Foundry at
Toronto, Ontario
Below —

Section of Plant
and Shop at
Toronto





Above —

Plant at
Montreal,
Que.

Right —

Plant at
Vancouver,
B. C.



Left —

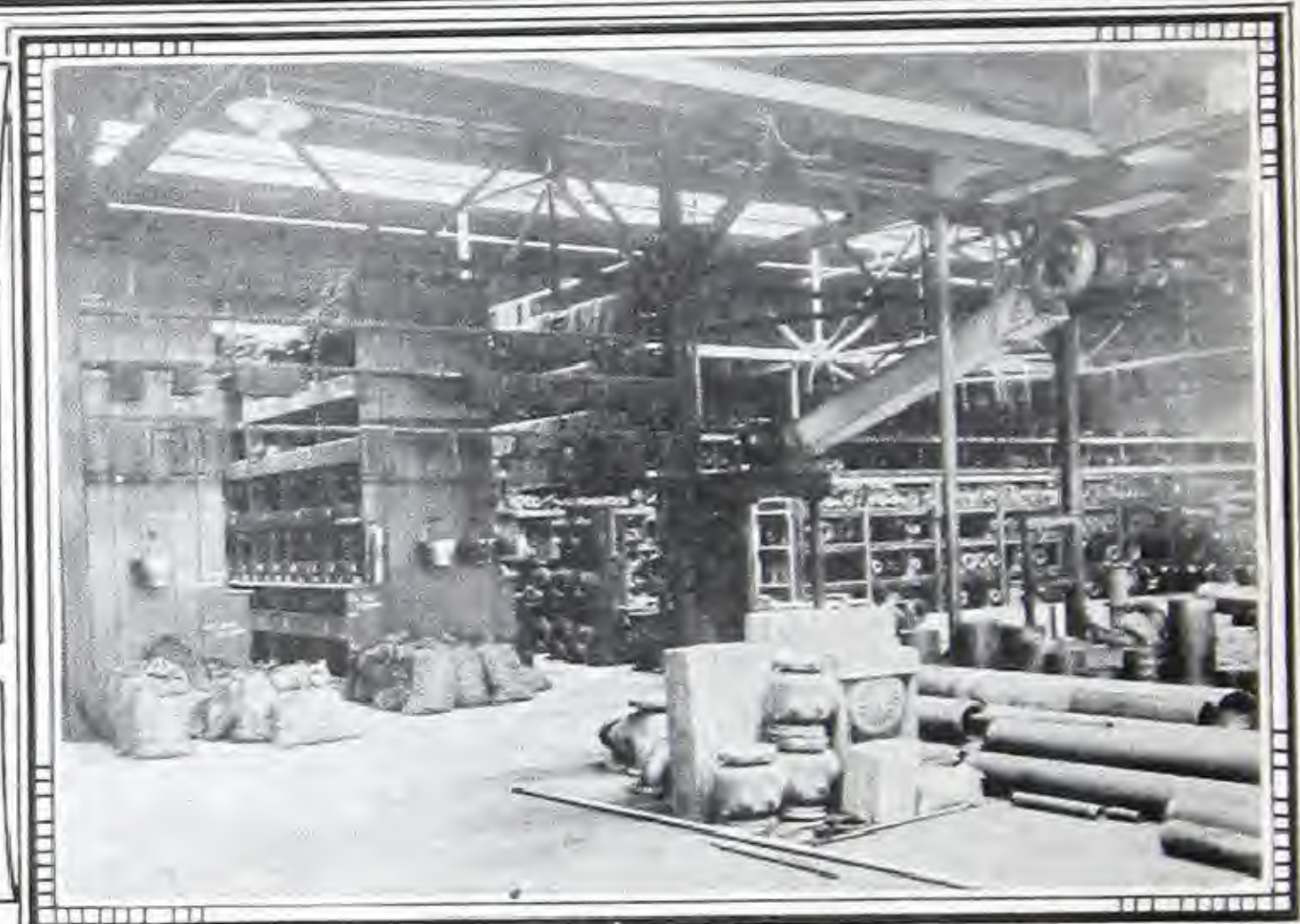
View of a
Section of
Main
Moulding
Floor
at
Grinnell
Toronto
Foundry





Above —
Section of
Montreal Plant
Interior —
Pipe Threading
Machines in Rear

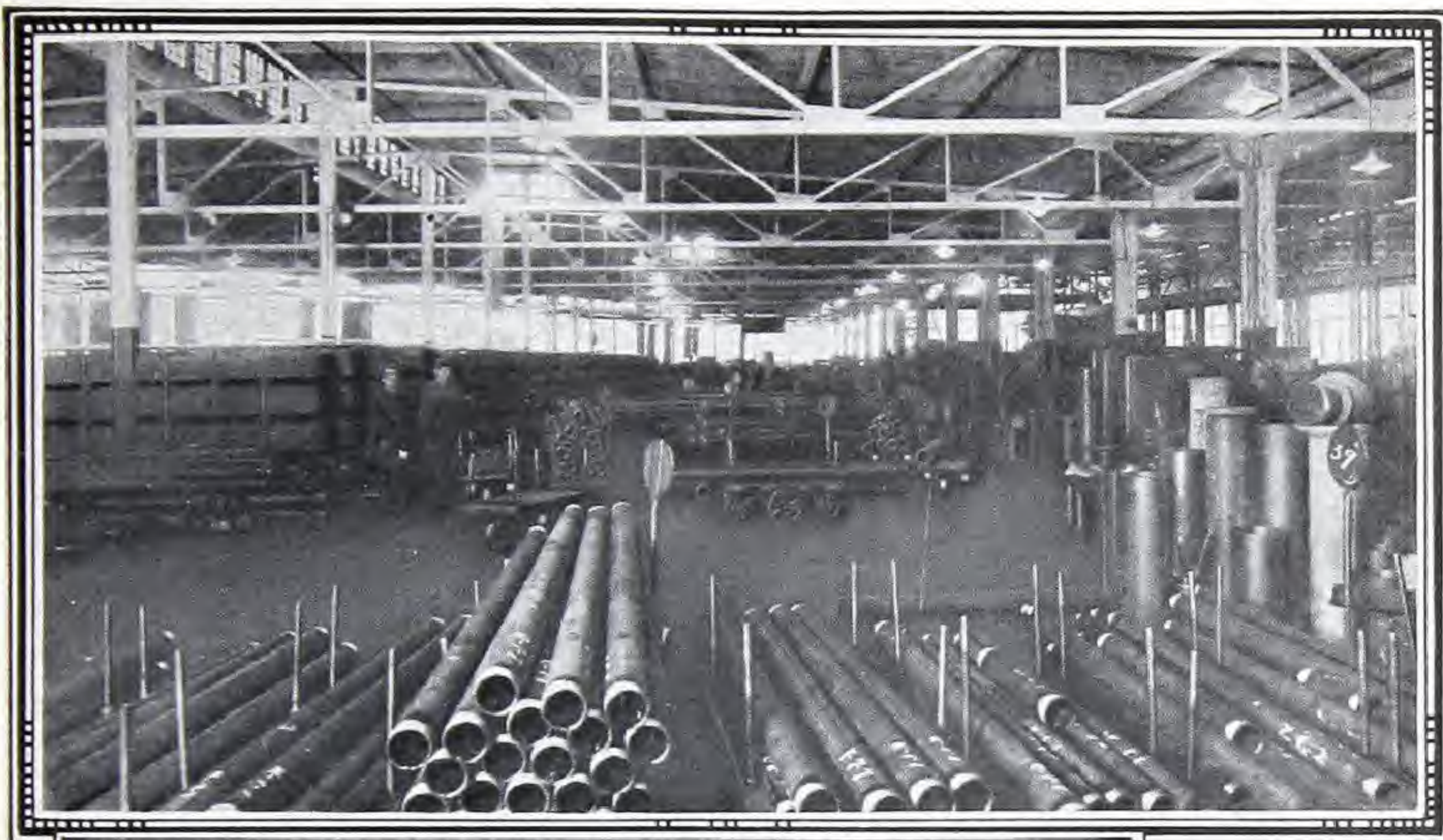
Right —
Section of
Stock Room at
Montreal Plant



Left —

View of a
Section of
Machine
Shop

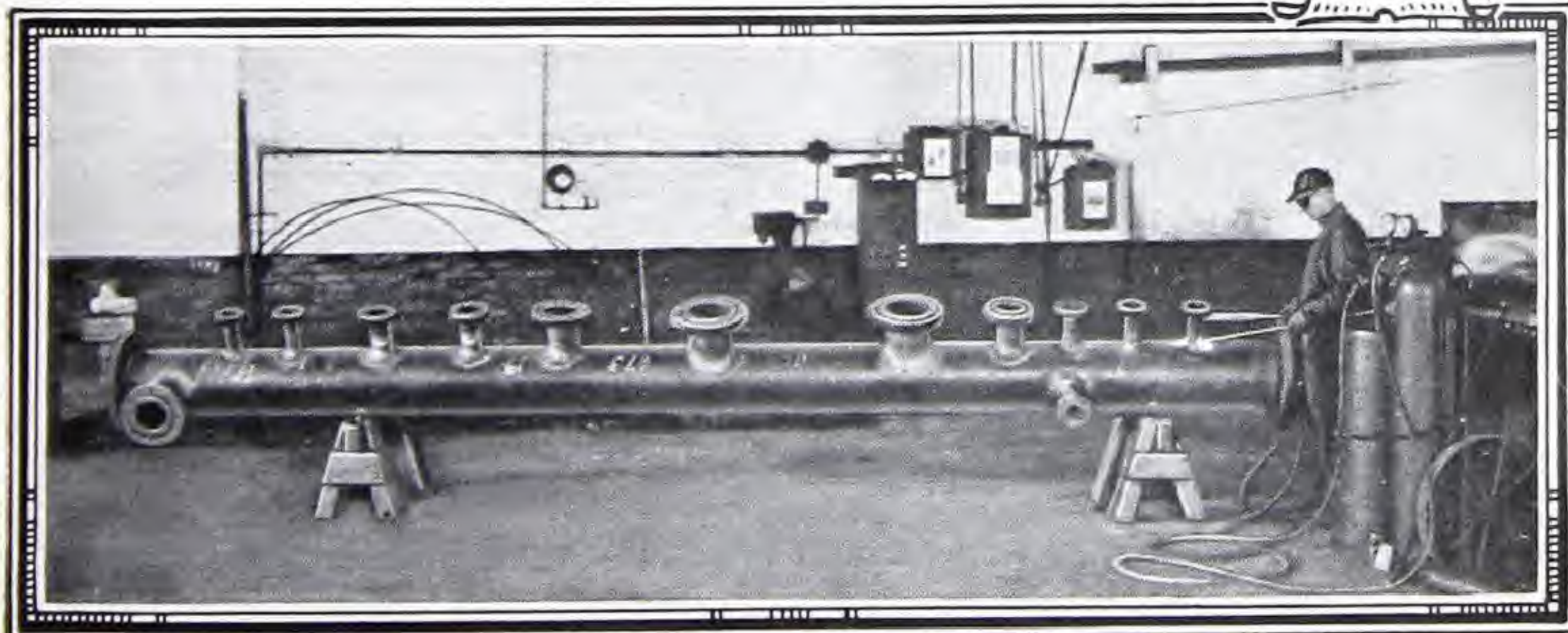
at
Grinnell
Toronto
Plant



Above—
Pipe Storage
at a Grinnell
Plant

At Left—
Section of
one of our
Pipe Bending
Departments

Below—
Grinnell Welder
at work





*Grinnell Products
Mean Better Jobs
With Less Labor*

TERMS OF SALE

Sale of Material included in this Catalogue is made subject to the following specifications

1. Contracts subject to strikes, accidents and other causes beyond our control.
2. We guarantee our material to the extent that we replace any proved defective when used for the purpose manufactured. No claims are to be made and no allowances will be made for labor, expense or damages resulting from or connected with defective material.
3. If material is defective, the amount of damage is the price of the defective material only.
4. When we grant permission to return goods of our manufacture or goods that we have billed, same will be credited subject to the following deductions:
 - (a) All material returned must on its arrival at our Works be found in first-class condition; if not, cost of putting in salable condition will be deducted from credit memoranda.
 - (b) A final deduction of ten per cent will be made from all credit memoranda issued for material returned.
 - (c) Transportation charges if not prepaid will be deducted from credit memoranda.
5. All material sent out will be carefully examined, counted, and packed by experienced employees only. Our responsibility for loss, or breakage, ceases on delivery to shipping agents, and claims, therefore, must be made on the carrier.
6. TERMS—Net cash, thirty days, unless otherwise agreed upon.
7. Prices Subject to Change Without Notice.

We endeavor to supply our customers the best material, and to accord to them such treatment as will merit their confidence and patronage.

GRINNELL COMPANY OF CANADA, LIMITED

PIPE

*Wrought Pipe—Iron and Steel**Extra Strong—Black and Galvanized*

All Weights and Dimensions are Nominal

Size	List Price per Foot	DIAMETERS		Thickness	Weight per Foot Plain Ends
		External	Internal		
$\frac{1}{8}$	\$.12	.405	.215	.095	.314
$\frac{1}{4}$	.07 $\frac{1}{2}$	.540	.302	.119	.535
$\frac{3}{8}$	.07 $\frac{1}{2}$	.675	.423	.126	.738
$\frac{1}{2}$	.11	.840	.546	.147	1.087
$\frac{3}{4}$	.15	1.050	.742	.154	1.473
1	.22	1.315	.957	.179	2.171
$1\frac{1}{4}$	.30	1.660	1.278	.191	2.996
$1\frac{1}{2}$	.36 $\frac{1}{2}$	1.900	1.500	.200	3.631
2	.50 $\frac{1}{2}$	2.375	1.939	.218	5.022
$2\frac{1}{2}$	.77	2.875	2.323	.276	7.661
3	1.03	3.500	2.900	.300	10.252
$3\frac{1}{2}$	1.25	4.000	3.364	.318	12.505
4	1.50	4.500	3.826	.337	14.983
$4\frac{1}{2}$	1.80	5.000	4.290	.355	17.611
5	2.08	5.563	4.813	.375	20.778
6	2.86	6.625	5.761	.432	28.573
7	3.81	7.625	6.625	.500	38.048
8	4.34	8.625	7.625	.500	43.388
9	4.90	9.625	8.625	.500	48.728
10	5.48	10.750	9.750	.500	54.735
11	6.10	11.750	10.750	.500	60.075
12	6.55	12.750	11.750	.500	65.415

All weights given in pounds. All dimensions in inches.

Extra Strong Pipe will be shipped in random lengths and plain ends unless otherwise ordered.

Random Length Extra Strong Pipe is considered to be 12 feet to 22 feet. We to have the privilege, however, of supplying not exceeding 10 per cent. of total order in lengths from 6 feet to 12 feet.

For pipe fitted with threads and couplings, an extra charge will be made above plain ends.

For cut lengths, an extra charge will be made above random.

For galvanized or asphalted, an extra charge will be made above black.

PIPE

Wrought Pipe—Iron and Steel
Double Extra Strong—Black and Galvanized

All Weights and Dimensions are Nominal

Size	List Price per Foot	DIAMETERS		Thickness	Weight per Foot Plain Ends
		External	Internal		
$\frac{1}{2}$	\$.32	.840	.252	.294	1.714
$\frac{3}{4}$	.35	1.050	.434	.308	2.440
1	.37	1.315	.599	.358	3.650
$1\frac{1}{4}$	.52 $\frac{1}{2}$	1.660	.896	.382	5.214
$1\frac{1}{2}$	.65	1.900	1.100	.400	6.403
2	.91	2.375	1.503	.436	9.029
$2\frac{1}{2}$	1.37	2.875	1.771	.552	13.695
3	1.86	3.500	2.300	.600	18.583
$3\frac{1}{2}$	2.30	4.000	2.728	.636	22.850
4	2.76	4.500	3.152	.674	27.541
$4\frac{1}{2}$	3.26	5.000	3.580	.710	32.530
5	3.86	5.563	4.063	.750	38.552
6	5.32	6.625	4.897	.864	53.160
7	6.35	7.625	5.875	.875	63.079
8	7.25	8.625	6.875	.875	72.424

The permissible variation in weight is 10 per cent. above and 10 per cent. below.

Furnished with plain ends and in random lengths, unless otherwise ordered.

All weights given in pounds. All dimensions given in inches.

Random length of Extra Strong and Double Extra Strong pipe is considered to be 12 feet to 22 feet, we to have the privilege, however, of supplying not exceeding 5 per cent. of total order in lengths from 6 feet to 12 feet.

For pipe fitted with threads and couplings, an extra charge will be made above plain ends.

For cut lengths, an extra charge will be made above random.

For Galvanized, or Coated pipe, an extra charge will be made above Black.

PIPE

Wrought Pipe—Iron and Steel

Large O. D. Pipe—Plain Ends

LIST PRICE PER FOOT

Size O.D.	THICKNESS											
	1/4	5/16	3/8	7/16	1/2	9/16	5/8	11/16	3/4	7/8	1	1 1/8
14	\$3.68	\$4.57	\$5.46	\$6.34	\$ 7.21	\$ 8.08	\$ 8.93	\$ 9.78	\$10.62	\$12.27	\$13.89	\$15.47
15	3.94	4.91	5.86	6.81	7.75	8.68	9.60	10.51	11.42	13.20	14.96	16.68
16	4.21	5.24	6.26	7.28	8.28	9.28	10.27	11.25	12.22	14.14	16.03	17.88
17	4.48	5.57	6.66	7.74	8.82	9.88	10.94	11.98	13.02	15.07	17.09	19.08
18	4.74	5.91	7.06	8.21	9.35	10.48	11.60	12.72	13.82	16.01	18.16	20.28
20	.....	6.58	7.86	9.15	10.42	11.68	12.94	14.19	15.42	17.88	20.30	22.68
21	.....	6.91	8.27	9.61	10.95	12.28	13.61	14.92	16.23	.....	.....	.....
22	.....	7.24	8.67	10.08	11.49	12.88	14.27	15.65	17.03	.....	.....	.....
24	.....	.....	9.47	11.01	12.55	14.09	15.61	17.12	18.63	.....	.....	.....
26	.....	.....	10.27	11.95	13.62	15.29	16.94	18.59	20.23	.....	.....	.....
28	.....	.....	.....	12.88	14.69	16.49	18.28	20.06	21.83	.....	.....	.....
30	.....	.....	.....	13.82	15.76	17.69	19.61	21.53	23.43	.....	.....	.....

WEIGHTS PER LINEAL FOOT

All Weights and Dimensions are Nominal

Size O.D.	THICKNESS											
	1/4	5/16	3/8	7/16	1/2	9/16	5/8	11/16	3/4	7/8	1	1 1/8
14	36.713	45.682	54.568	63.371	72.091	80.726	89.279	97.748	106.134	122.654	138.842	154.695
15	39.383	49.020	58.573	68.044	77.431	86.734	95.954	105.091	114.144	132.000	149.522	166.710
16	42.053	52.357	62.579	72.716	82.771	92.742	102.629	112.433	122.154	141.345	160.202	178.725
17	44.723	55.695	66.584	77.389	88.111	98.749	109.304	119.776	130.164	150.690	170.882	190.740
18	47.393	59.032	70.589	82.061	93.451	104.757	115.979	127.118	138.174	160.035	181.562	202.756
20	.....	65.708	78.599	91.407	104.131	116.772	129.330	141.804	154.194	178.725	202.923	226.786
21	.....	69.045	82.604	96.079	109.471	122.780	136.005	149.146	162.204	.....	.....	.....
22	.....	72.383	86.609	100.752	114.811	128.787	142.680	156.489	170.215	.....	.....	.....
24	.....	.....	94.619	110.097	125.491	140.802	156.030	171.174	186.235	.....	.....	.....
26	.....	.....	102.629	119.442	136.172	152.818	169.380	185.859	202.255	.....	.....	.....
28	.....	.....	.....	128.787	146.852	164.833	182.730	200.545	218.275	.....	.....	.....
30	.....	.....	.....	138.132	157.532	176.848	196.081	215.230	234.296	.....	.....	.....

The permissible variation in weight is 10% above and 10% below.

All weights given in pounds. All dimensions given in inches.

Large O. D. Pipe will be shipped in random lengths and plain ends unless otherwise ordered. For this pipe, fitted with threads and couplings, an extra charge will be made above regular.

For cut lengths an extra charge will be made above random

For galvanized or asphalted pipe an extra charge will be made above black.

PIPE

Lap Welded Steel Boiler Tubes

LIST PRICE PER FOOT

External Diameter Inches	STANDARD THICKNESS, MINIMUM		PRICE PER FOOT				
	Birming- ham Wire Gauge	Inches	Standard Thickness	One Extra Wire Gauge	Two Extra Wire Gauges	Three Extra Wire Gauges	Four Extra Wire Gauges
1 $\frac{3}{4}$	13	.095	\$.22	\$.26	\$.28	\$.31	\$.34
2	13	.095	.21	.24	.26	.28	.31
2 $\frac{1}{4}$	13	.095	.24	.27	.29	.32	.35
2 $\frac{1}{2}$	12	.109	.30	.33	.36	.39	.43
2 $\frac{3}{4}$	12	.109	.34	.37	.40	.44	.48
3	12	.109	.38	.41	.45	.49	.54
3 $\frac{1}{4}$	11	.120	.45	.49	.53	.59	.63
3 $\frac{1}{2}$	11	.120	.48	.53	.58	.64	.69
3 $\frac{3}{4}$	11	.120	.52	.57	.62	.68	.74
4	10	.134	.61	.66	.73	.79	.88
4 $\frac{1}{2}$	10	.134	.69	.75	.83	.89	.99
5	9	.148	.81	.90	.97	1.08	1.17
6	8	.165	1.08	1.17	1.31	1.41	1.52
7	8	.165	1.27	1.38	1.54	1.66	1.78
8	8	.165	1.45	1.58	1.76	1.90	2.05
9	7	.180	1.78	1.99	2.15	2.31	2.50
10	6	.203	2.22	2.39	2.57	2.79	3.04
11	5	.220	2.63	2.84	3.07	3.35	3.53
12	—	.229	2.99	3.23	3.51	3.76	4.10
13	4	.238	3.36	3.64	3.93	4.19	4.72

Boiler Tubes to special specifications, special prices on application.

Tubes more than four gauges heavier than Standard will be charged per pound.

PIPE
Wrought Couplings



Standard Coupling
Fig. No. 336

Size Inches	Price Black	Price Galvanized	Price Right and Left Black
$\frac{1}{8}$	.05	.06	....
$\frac{1}{4}$	.05	.06	.07
$\frac{3}{8}$	.06	.08	.08
$\frac{1}{2}$	.07	.10	.11
$\frac{3}{4}$	.10	.13	.15
1	.13	.18	.20
$1\frac{1}{4}$	.17	.25	.25
$1\frac{1}{2}$	.21	.32	.30
2	.28	.40	.50
$2\frac{1}{2}$	.40	.55	.85
3	.60	.80	1.20
$3\frac{1}{2}$	.80	1.05	1.60
4	1.00	1.40	2.00
$4\frac{1}{2}$	1.50	2.00	....
5	1.65	2.25	....
6	2.40	3.25	....
7	3.25	4.20	....
8	4.25	5.50	....
9	5.50	7.00	....
10	7.50	9.75	....
12	10.00	13.65	....

Order by Figure Number.

PIPE

Wrought Couplings



Extra Heavy Coupling
Fig. No. 336-A



Extra Heavy Recessed Coupling
Fig. No. 337

Size Inches	Extra Heavy Coupling Fig. No. 336-A		Extra Heavy Recessed Coupling Fig. No. 337	
	Black Each	Galvanized Each	Black Each	Galvanized Each
$\frac{1}{8}$	.10	.12	....	....
$\frac{1}{4}$	.10	.12	.11	.13
$\frac{3}{8}$	.12	.16	.13	$.17\frac{1}{2}$
$\frac{1}{2}$	.14	.20	$.15\frac{1}{2}$	.22
$\frac{3}{4}$	.20	.26	.22	$.28\frac{1}{2}$
1	.26	.36	$.28\frac{1}{2}$	$.39\frac{1}{2}$
$1\frac{1}{4}$	.34	.50	$.37\frac{1}{2}$	.55
$1\frac{1}{2}$	.42	.64	.46	$.70\frac{1}{2}$
2	.56	.80	$.61\frac{1}{2}$	.88
$2\frac{1}{2}$	.80	1.10	.88	1.21
3	1.20	1.60	1.32	1.76
$3\frac{1}{2}$	1.60	2.10	1.76	2.31
4	2.00	2.80	2.20	3.08
$4\frac{1}{2}$	3.00	4.00	3.30	4.40
5	3.30	4.50	3.63	4.95
6	4.80	6.50	5.28	7.15
7	6.50	8.40	7.16	9.24
8	8.50	11.00	9.35	12.10
9	11.00	14.00	12.10	15.40
10	15.00	19.50	16.50	21.45
12	20.00	27.30	22.00	30.03

Fig. No. 337—For use as Line Pipe Coupling, Drive Pipe Coupling, and on Extra Strong Pipe.

Order by Figure Number.

PIPE

Wrought Nipples
Black — Right Hand



Close Nipple
 Fig. No. 339



Short or Long Nipple
 Fig. No. 340

Size Inches	LENGTH IN INCHES						LIST PRICES	
	*Close	*Short	Long				Close or Short	Long
$\frac{1}{8}$	$\frac{3}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	\$.04	\$.06
$\frac{1}{4}$	$\frac{7}{8}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	.04	.06
$\frac{3}{8}$	1	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	.04	.06
$\frac{1}{2}$	$1\frac{1}{8}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	.05	.07
$\frac{3}{4}$	$1\frac{3}{8}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	.06	.09
1	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	.08	.13
$1\frac{1}{4}$	$1\frac{5}{8}$	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	.11	.17
$1\frac{1}{2}$	$1\frac{3}{4}$	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	.13	.20
2	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	.18	.27
$2\frac{1}{2}$	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	.39	.59
3	$2\frac{5}{8}$	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	.48	.72
$3\frac{1}{2}$	$2\frac{3}{4}$	4	$4\frac{1}{2}$	5	$5\frac{1}{2}$	6	.75	1.05
4	$2\frac{7}{8}$	4	$4\frac{1}{2}$	5	$5\frac{1}{2}$	6	.85	1.20
$4\frac{1}{2}$	$2\frac{7}{8}$	4	$4\frac{1}{2}$	5	$5\frac{1}{2}$	6	1.25	1.70
5	3	$4\frac{1}{2}$	5	$5\frac{1}{2}$	6	$6\frac{1}{2}$	1.55	2.45
6	$3\frac{1}{8}$	$4\frac{1}{2}$	5	$5\frac{1}{2}$	6	$6\frac{1}{2}$	1.85	2.90
7	$3\frac{1}{4}$	5					3.20	
8	$3\frac{1}{2}$	5					3.55	
9	$3\frac{5}{8}$	5					5.25	
10	$3\frac{7}{8}$	5					6.75	
12	$4\frac{1}{2}$	6					8.00	

*These lengths conform to Manufacturer's Standard. Extra Heavy Nipples double above List Prices.

Double Extra Heavy Nipples are made to order and charged as Pipe, Cuts and Threads. Order by Figure Number.

PIPE
Wrought Nipples—Extra Long
Black — Right Hand



Extra Long Nipple—Fig. No. 341

Size Inches	Length—Inches								
	4	4½	5	5½	6	6½	7	7½	8
⅛	.07	.08	.08	.10	.10	.12	.12	.14	.14
¼	.07	.08	.08	.10	.10	.12	.12	.14	.14
⅜	.07	.08	.08	.10	.10	.12	.12	.14	.14
½	.08	.10	.10	.12	.12	.14	.14	.16	.16
¾11	.11	.13	.13	.17	.17	.18	.18
115	.15	.18	.18	.23	.23	.25	.25
1¼20	.24	.24	.29	.29	.33	.33
1½25	.29	.29	.36	.36	.40	.40
232	.38	.38	.50	.50	.54	.54
2½68	.68	.90	.90	.97	.97
385	.85	1.08	1.08	1.20	1.20
3½	1.30	1.30	1.45	1.45
4	1.52	1.52	1.69	1.69
4½	2.25	2.25	2.50	2.50
5	2.58	2.83	2.83
6	3.05	3.35	3.35
7	3.60	...	4.05	...	4.45
8	4.05	...	4.55	...	5.05
9	6.50
10	8.25
12	10.00

Size Inches	Length—Inches							
	8½	9	9½	10	10½	11	11½	12
⅛	.15	.15	...	.17	.18	.18	.19	.19
¼	.15	.15	.17	.17	.18	.18	.19	.19
⅜	.15	.15	.17	.17	.18	.18	.19	.19
½	.18	.18	.20	.20	.22	.22	.23	.23
¾	.20	.20	.22	.22	.24	.24	.26	.26
1	.28	.28	.31	.31	.34	.34	.36	.36
1¼	.36	.36	.40	.40	.44	.44	.47	.47
1½	.45	.45	.50	.50	.54	.54	.59	.59
2	.59	.59	.65	.65	.72	.72	.77	.77
2½	1.06	1.06	1.17	1.17	1.26	1.26	1.35	1.35
3	1.33	1.33	1.45	1.45	1.58	1.58	1.70	1.70
3½	1.60	1.60	1.75	1.75	1.90	1.90	2.05	2.05
4	1.87	1.87	2.05	2.05	2.22	2.22	2.40	2.40
4½	2.75	2.75	2.95	2.95	3.17	3.17	...	3.40
5	3.10	3.10	3.35	3.35	3.60	3.60	3.85	3.85
6	3.70	3.70	4.00	4.00	...	4.30	4.65	4.65
7	...	4.90	...	5.30	...	5.75	...	6.15
8	...	5.50	...	6.00	...	6.50	...	7.00
9	...	7.10	...	7.75	...	8.40	...	9.00
10	...	8.90	...	9.70	...	10.40	...	11.15
12	...	10.80	...	11.75	...	12.70	...	13.65

Extra Heavy Nipples double above list prices.

Double Extra Heavy Nipples are made to order and charged as Pipe, Cuts and Threads.

Nipples longer than 12 inches made to order and charged as cut pipe with threads extra.

Order by Figure Number.

PIPE
Wrought Nipples
Black — Right and Left Threads



Right and Left Nipple—Fig. No. 342

Size Inches	LENGTH—INCHES						LIST PRICES	
	*Close	*Short	Long				Close or Short	Long
$\frac{1}{8}$	$\frac{3}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	.05	.08
$\frac{1}{4}$	$\frac{7}{8}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	.05	.08
$\frac{3}{8}$	1	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	.05	.08
$\frac{1}{2}$	$1\frac{1}{8}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	.07	.10
$\frac{3}{4}$	$1\frac{3}{8}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	.08	.12
1	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	.11	.18
$1\frac{1}{4}$	$1\frac{5}{8}$	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	.15	.23
$1\frac{1}{2}$	$1\frac{3}{4}$	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	.18	.27
2	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	.24	.36
$2\frac{1}{2}$	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	.52	.79
3	$2\frac{5}{8}$	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	.65	.96
$3\frac{1}{2}$	$2\frac{3}{4}$	4	$4\frac{1}{2}$	5	$5\frac{1}{2}$	6	1.00	1.40
4	$2\frac{7}{8}$	4	$4\frac{1}{2}$	5	$5\frac{1}{2}$	6	1.15	1.60

Size Inches	LIST PRICES OF EXTRA LONG NIPPLES								
	LENGTH—INCHES								
	4	5	6	7	8	9	10	11	12
$\frac{1}{8}$	.09	.11	.13	.16	.18	.20	.23	.25	.27
$\frac{1}{4}$	.09	.11	.13	.16	.18	.20	.23	.25	.27
$\frac{3}{8}$	.09	.11	.13	.16	.18	.20	.23	.25	.27
$\frac{1}{2}$	.11	.13	.16	.18	.21	.24	.27	.29	.31
$\frac{3}{4}$	...	.15	.17	.23	.25	.27	.29	.32	.35
1	...	.20	.24	.31	.33	.37	.41	.45	.48
$1\frac{1}{4}$	...	.27	.32	.39	.45	.50	.55	.60	.65
$1\frac{1}{2}$	...	.34	.39	.48	.52	.60	.67	.72	.80
2	...	.43	.51	.67	.72	.80	.87	.96	1.03
$2\frac{1}{2}$	...	...	.91	1.20	1.30	1.40	1.55	1.68	1.80
3	...	...	1.13	1.44	1.60	1.77	1.93	2.10	2.27
$3\frac{1}{2}$	...	...	....	1.75	1.95	2.15	2.35	2.55	2.75
4	...	...	....	2.00	2.25	2.50	2.75	3.00	3.25

* These Lengths conform to Manufacturer's Standard. Add 60 per cent to above prices for Galvanized Right and Left Nipples.
Order by Figure Number.

PIPE

Wrought Nipples

Galvanized — Right Hand

Close Nipple
Fig. No. 343Short or Long Nipple
Fig. No. 344

Size Inches	LENGTH—INCHES						LIST PRICES	
	*Close	*Short	Long				Close or Short	Long
$\frac{1}{8}$	$\frac{3}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	.06	.11
$\frac{1}{4}$	$\frac{7}{8}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	.06	.11
$\frac{3}{8}$	1	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	.06	.11
$\frac{1}{2}$	$1\frac{1}{8}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	.06	.11
$\frac{3}{4}$	$1\frac{3}{8}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	.08	.14
1	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	.11	.19
$1\frac{1}{4}$	$1\frac{5}{8}$	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	.17	.29
$1\frac{1}{2}$	$1\frac{3}{4}$	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	.21	.35
2	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	.27	.47
$2\frac{1}{2}$	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	.56	.86
3	$2\frac{5}{8}$	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	.70	1.10
$3\frac{1}{2}$	$2\frac{3}{4}$	4	$4\frac{1}{2}$	5	$5\frac{1}{2}$	6	1.20	1.70
4	$2\frac{7}{8}$	4	$4\frac{1}{2}$	5	$5\frac{1}{2}$	6	1.35	1.87
$4\frac{1}{2}$	$2\frac{7}{8}$	4	$4\frac{1}{2}$	5	$5\frac{1}{2}$	6	1.85	2.60
5	3	$4\frac{1}{2}$	5	$5\frac{1}{2}$	6	$6\frac{1}{2}$	2.30	3.15
6	$3\frac{1}{8}$	$4\frac{1}{2}$	5	$5\frac{1}{2}$	6	$6\frac{1}{2}$	2.80	4.25
7	$3\frac{1}{4}$	5	...	...	...	...	4.25	....
8	$3\frac{1}{2}$	5	...	...	...	...	5.00	....

* These lengths conform to Manufacturer's Standard.
Order by Figure Number.

PIPE

Wrought Nipples—Extra Long
Galvanized—Right Hand

Extra Long Nipple—Fig. No. 345

Size Inches	LIST PRICES FOR EXTRA LONG NIPPLES							
	Length—Inches							
	4	4½	5	5½	6	6½	7	7½
⅛	.12	.15	.15	.17	.17	...	.21	...
¼	.12	.15	.15	.17	.17	...	.21	.24
⅜	.12	.15	.15	.17	.17	.21	.21	.24
½	.13	.16	.16	.18	.18	.23	.23	.26
¾	...	.18	.18	.21	.21	.26	.26	.29
1	...	.24	.24	.28	.28	.34	.34	.38
1¼	...	...	.32	.38	.38	.45	.45	.51
1½	...	...	.39	.46	.46	.55	.55	.63
2	...	...	.52	.61	.61	.74	.74	.83
2½	...	...	...	1.00	1.00	1.26	1.26	...
3	...	...	...	1.30	1.30	1.60	1.60	1.80
3½	...	...	...	...	...	...	2.10	...
4	...	...	...	...	...	2.30	2.30	2.60
4½	...	...	...	...	...	...	3.30	...
5	...	...	...	...	...	...	3.75	...
6	...	...	...	...	...	...	4.50	...
7	...	...	...	...	4.95	...	5.65	...
8	...	...	...	...	5.80	...	6.65	...

Size Inches	LIST PRICES FOR EXTRA LONG NIPPLES							
	Length—Inches							
	8	8½	9	9½	10	10½	11	12
⅛	.24	...	.26	...	.29	...	.31	.34
¼	.24	...	.26	...	.29	...	.31	.34
⅜	.24	.26	.26	...	.29	.31	.31	.34
½	.26	.28	.28	.31	.31	.33	.33	.36
¾	.29	.32	.32	.35	.35	.38	.38	.41
1	.38	.42	.42	.47	.47	...	.51	.55
1¼	.51	...	.57	.63	.63	.69	.69	.75
1½	.63	.70	.70	...	.77	.84	.84	.91
2	.83	.93	.93	...	1.03	1.13	1.13	1.23
2½	1.41	...	1.56	...	1.71	1.86	1.86	2.01
3	1.80	2.00	2.00	...	2.20	...	2.40	2.60
3½	2.35	...	2.60	...	2.85	...	3.15	3.40
4	2.60	2.90	2.90	3.20	3.20	3.50	3.50	3.80
4½	3.65	...	4.05	...	4.45	...	4.85	5.25
5	4.20	...	4.60	...	5.00	...	5.40	5.85
6	5.00	...	5.55	...	6.05	...	6.60	7.15
7	6.35	...	7.05	...	7.75	...	8.45	9.20
8	7.50	...	8.35	...	9.25	...	10.10	10.95

PIPE
Long Screws
With Coupling and Locknut Faced



Long Screw with Coupling and Locknut
Fig. No. 346

LONG SCREWS WITH COUPLING AND
LOCKNUT FACED—Fig. No. 346

Size.....Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$
Standard length.....Inches	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5
Price, Black.....Each	.30	.35	.40	.55	.75	1.00
Price, Galvanized.....Each	.35	.40	.50	.66	1.00	1.25

Size.....Inches	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4
Standard length.....Inches	$5\frac{1}{2}$	6	7	8	$8\frac{1}{2}$	9
Price, Black.....Each	1.30	1.70	2.70	3.70	5.40	6.60
Price, Galvanized.....Each	1.60	2.10	3.10	4.70	6.50	7.75

FACED LOCKNUTS—Fig. No. 347

Size.....Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1
Price, Black.....Each	.08	.09	.10	.12	.15
Price, Galvanized.....Each	.11	.13	.15	.18	.22

Size.....Inches	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Price, Black.....Each	.20	.25	.30	.35	.45
Price, Galvanized.....Each	.30	.35	.45	.50	.65

FACED COUPLINGS—Fig. No. 348

Size.....Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Price, Black.....Each	.09	.10	.12	.16	.22	.30	.40	.50
Price, Galvanized.....Each	.14	.15	.18	.24	.33	.45	.60	.75

Size.....Inches	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	6	
Price, Black.....Each	.70	.90	1.20	1.50	2.10	2.40	3.60	....
Price, Galvanized.....Each	1.00	1.35	1.80	2.25	....	....	....	....

Long screws, longer than standard, made to order and charged as cut pipe, with threads, couplings and locknuts, extra. In ordering, always specify the length of thread wanted.

Extra heavy long screws made to order.
Order by Figure Number.

PIPE

Seamless Drawn Brass and Copper Tubing

IRON PIPE SIZES—REGULAR

Size Inches	DIMENSIONS		APPROXIMATE WEIGHT	
	Inside Diameter Inches	Outside Diameter Inches	Brass Per Lin. Foot Pounds	Copper Per Lin. Foot Pounds
$\frac{1}{8}$	.281	.405	.246	.259
$\frac{1}{4}$	.375	.540	.437	.459
$\frac{3}{8}$	.494	.675	.612	.644
$\frac{1}{2}$	.625	.840	.911	.958
$\frac{3}{4}$	.822	1.05	1.235	1.298
1	1.062	1.315	1.740	1.829
$1\frac{1}{4}$	1.368	1.66	2.557	2.689
$1\frac{1}{2}$	1.600	1.90	3.037	3.193
2	2.062	2.375	4.017	4.224
$2\frac{1}{2}$	2.500	2.875	5.830	6.130
3	3.062	3.50	8.314	8.741
$3\frac{1}{2}$	3.500	4.00	10.85	11.41
4	4.000	4.50	12.29	12.93
$4\frac{1}{2}$	4.500	5.00	13.74	14.44
5	5.062	5.563	15.40	16.19
6	6.125	6.625	18.44	19.39
7	7.062	7.625	23.92	25.15
8	8.000	8.625	30.05	31.60
9	8.937	9.625	36.94	38.84
10	10.019	10.750	43.91	46.17

IRON PIPE SIZES—EXTRA HEAVY

Size Inches	DIMENSIONS		APPROXIMATE WEIGHT	
	Inside Diameter Inches	Outside Diameter Inches	Brass Per Lin. Foot Pounds	Copper Per Lin. Foot Pounds
$\frac{1}{8}$	.205	.405	.353	.371
$\frac{1}{4}$	.294	.540	.593	.624
$\frac{3}{8}$	.421	.675	.805	.847
$\frac{1}{2}$	.542	.840	1.191	1.253
$\frac{3}{4}$	.736	1.050	1.622	1.706
1	.951	1.315	2.386	2.509
$1\frac{1}{4}$	1.272	1.660	3.291	3.460
$1\frac{1}{2}$	1.494	1.900	3.986	4.191
2	1.933	2.375	5.508	5.791
$2\frac{1}{2}$	2.315	2.875	8.407	8.839
3	2.892	3.500	11.24	11.82
$3\frac{1}{2}$	3.358	4.00	13.66	14.37
4	3.818	4.50	16.41	17.25
$4\frac{1}{2}$	4.250	5.000	20.07	21.10
5	4.813	5.563	22.51	23.67
6	5.750	6.625	31.32	32.93
7	6.625	7.625	41.22	43.34
8	7.625	8.625	47.00	49.42

Furnished with plain ends, unless otherwise specified.

Commercial lengths are 12 feet long, 18 foot lengths can be made to order.

Price on application.

PIPE

Brass Nipples



Close Nipple
Fig. No. 349



Shoulder Nipple
Fig. No. 350

IRON PIPE SIZES—REGULAR

LIST PRICES

Size	Length Close	Close Each	LENGTH, INCHES									
			1½	2	2½	3	3½	4	4½	5	5½	6
1/8	¾	.11	.13	.15	.17	.19	.21	.23	.25	.27	.29	.31
1/4	7/8	.13	.16	.19	.22	.25	.28	.31	.34	.37	.40	.43
3/8	1	.15	.19	.23	.27	.31	.35	.39	.43	.47	.51	.55
1/2	1 1/8	.23	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70
3/4	1 3/8	.28	...	.35	.42	.49	.56	.63	.70	.77	.84	.91
1	1 1/2	.37	...	.44	.53	.62	.71	.80	.89	.98	1.07	1.16
1 1/4	1 5/8	.60	...	...	.75	.88	1.01	1.14	1.27	1.40	1.53	1.66
1 1/2	1 3/4	.70	...	...	.90	1.05	1.20	1.35	1.50	1.65	1.80	1.95
2	2	1.00	...	...	1.20	1.40	1.60	1.80	2.00	2.20	2.40	2.60
2 1/2	2 1/2	1.70	...	...	...	2.00	2.30	2.60	2.90	3.20	3.50	3.80
3	2 5/8	2.50	...	...	...	2.90	3.30	3.70	4.10	4.50	4.90	5.30
3 1/2	2 3/4	4.00	...	...	...	...	...	5.40	6.00	6.60	7.20	7.80
4	2 7/8	4.75	...	...	...	...	...	6.15	6.85	7.55	8.25	8.95
4 1/2	2 7/8	5.50	...	...	...	...	...	7.20	8.05	8.90	9.75	10.60
5	3	8.50	...	...	...	...	...	...	10.60	11.65	12.70	13.75
6	3 1/8	11.50	...	...	...	...	...	...	14.10	15.40	16.70	18.00

Finished Brass Nipples, longer than close, 25 per cent extra.

Finished and Nickel Plated, longer than close, 50 per cent extra.

For Prices of Nipples longer than 6 inch, add to the above proportionate advances per inch.

For Extra Heavy Rough Nipples, double above lists.

For Locknut Nipples add 25 per cent to above lists.

Order by Figure Number.

PIPE

Pipe Bends Made from Lap Welded Pipe

The making of Bends, Welds and Lap Joints is a specialty of Grinnell Company. Our facilities for this class of work are second to none.

At our plants are large departments fully equipped to furnish bends in Full Standard Weight, Extra Heavy or Double Extra Heavy Wrought Pipe, bent in any desired form and equipped with Screwed, Shrink, Lap or Welded Flanges in Standard, Extra Heavy or Hydraulic dimensions. These flanges can be made of Cast Iron, High-Test Gray-Iron (Semi-Steel), Malleable Iron, Cast Steel, Forged or Rolled Steel, the only exception being that welded joints will be furnished only in Forged or Rolled Steel.

Where bends are used to take care of expansion we recommend the use of Extra Heavy Cast Steel, or Forged or Rolled Steel Flanges.

Grinnell Bends are true to radius, free from buckles and flat places. Our mechanical filling and hammering machine which replaces the old method of hand filling, eliminates the human element in this important feature of pipe bending and insures the best possible product.

On opposite page we show designs of the most commonly used pipe bends. Our facilities, however, enable us to fabricate special bends in any shape or dimensions to which it is practical to bend pipe.

In the table on opposite page we give the shortest recommended radii and tangents for different sizes of full weight and extra strong pipe; but wherever possible these radii should be increased to the allowable limits, as a short radius bend is not as flexible as one built with a longer radius. Five or six diameters of the pipe makes a safe radius.

On page 27 we show a table of approximate lengths of pipe in quarter bends. The limit given in this table is a 20 foot random length of pipe. It is possible, however, to procure some sizes in 40 foot lengths. Usually bends can be designed to come within these limits, or when this is not possible, two lengths of pipe can be welded together to form bends of longer dimensions.

On page 28 we give a table of the values of the various types of bends for taking care of expansions and contractions.

SPECIFICATION FOR BENDS

A request for estimates, or an order for bends should be accompanied by a sketch or blue print giving all necessary dimensions. This should also state thickness of pipe (see page 26) and type of joint and flanges to be furnished. (See pages 30 to 32.)

PIPE

Pipe Bends

Made From Standard or Extra Heavy Wrought Pipe
Pipe Bent In Any Desired Form

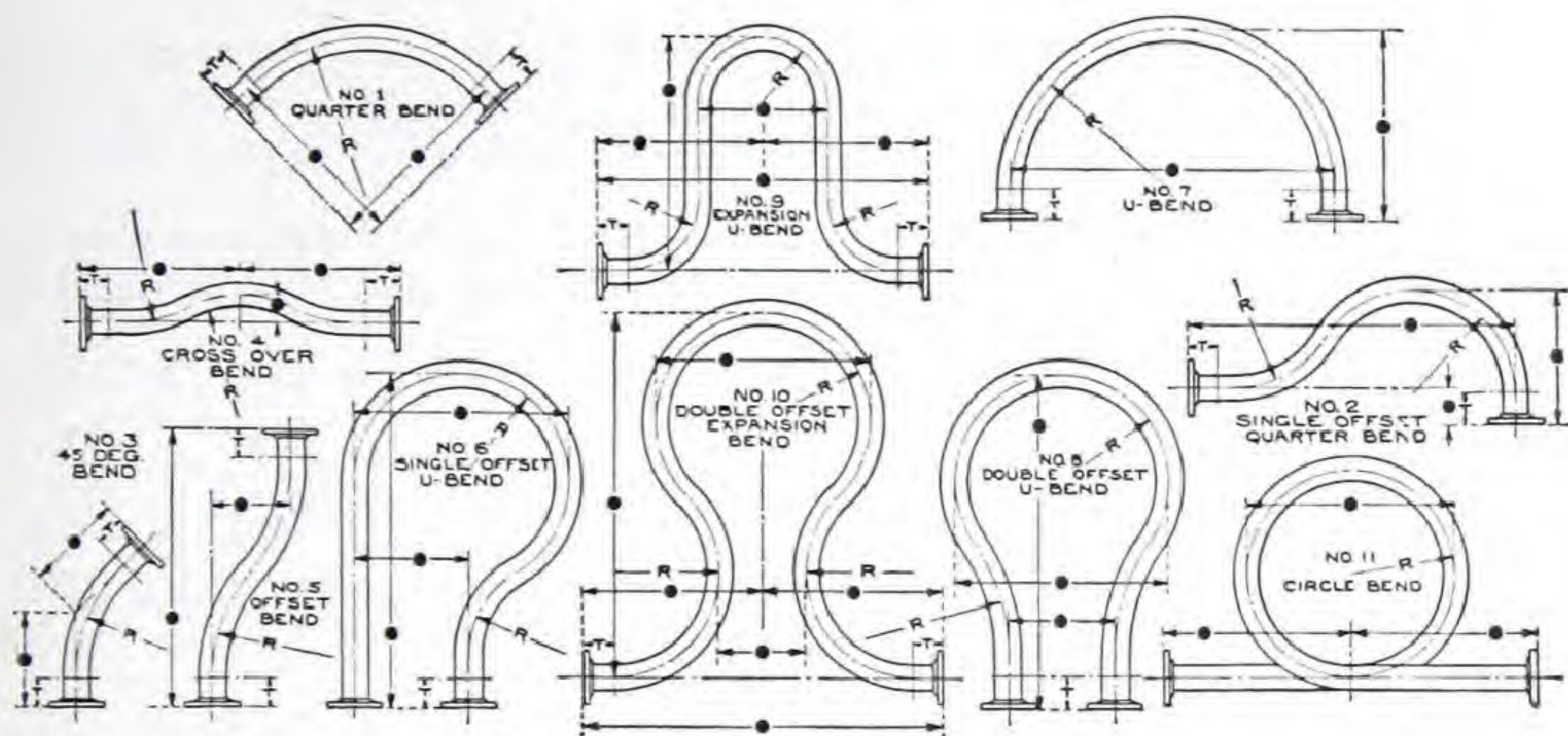


TABLE OF RADII FOR WROUGHT PIPE BENDS

Size of Pipe Inches	Advisable Radius of Bends Inches	Shortest Radius to which Pipe can be bent		Minimum Length of Tangent or Straight part of Bends		
		*Standard Pipe Inches	†Extra Heavy Pipe Inches	Screwed or Shrink Joints Inches	Welded Joint Inches	Lap Joint Inches
2½	12½	10	7	4		
3	15	12	8	4	5	6
3½	17½	14	10	5	5	6
4	20	16	12	5	5	6
4½	22½	18	14	6	5	6
5	25	20	15	6	5	7
6	30	26	20	7	6	7
7	35	30	24	8	6	8
8	40	34	28	9	6	8
9	45	42	35	11	6	9
10	50	45	40	12	7	10
12	60	54	50	14	7	10
14	70	70	65	16	7	14
15	75	75	70	16	7	14
16	80	80	78	18	8	16
18	108	90	88	18	8	18
20	120	104	104	18	8	18
22	132	132	132	18	9	20
24	144	144	144	18	9	20

*For 14-inch O. D. Pipe and larger having ⅛ inch or lighter metal.

†For 14-inch O. D. Pipe and larger having ½ inch or heavier metal.

Dimension sketch or blue print should accompany all inquiries or orders for bends.

Drawings submitted should include dimensions R., T. and those marked • ; also note any variations from above bends.

Prices on application.

PIPE

Thickness of Pipe for Various Bends

The thicknesses given in the table below are the lightest we recommend, and carry a sufficient safety factor, taking into consideration the scaling of pipe in the bending fire and thinning of wall due to stretching during the bending process.

The thickness of the wall of the pipe in a bend should be determined by the pressure under which the bend is to be operated and the diameter of the pipe.

We will be pleased to give our recommendations for any particular service or condition.

WORKING PRESSURE	RADIUS	PIPE SIZE	PIPE THICKNESS
Up to 125 Pounds	4 to 5 Diameters	7 inches and Smaller 8 inches and Larger	Extra Strong $\frac{1}{2}$ inch Thick
	Over 5 Diameters	7 inches and Smaller 8 inches 10 inches 12 inches 14 to 16 inches inclusive 18 to 22 inches inclusive 24 to 30 inches inclusive	Standard 28.55 lbs. per ft. 40.48 lbs. per ft. 49.56 lbs. per ft. $\frac{5}{16}$ in. Thick $\frac{3}{8}$ in. Thick $\frac{7}{16}$ in. Thick
125 to 250 Pounds	4 to 6 Diameters	7 inches and Smaller 8 inches and Larger	Extra Strong $\frac{1}{2}$ in. Thick
	Over 6 Diameters	7 inches and Smaller 8 inches 10 inches 12 inches 14 to 16 inches inclusive 18 to 22 inches inclusive 24 to 30 inches inclusive	Standard 28.55 lbs. per ft. 40.48 lbs. per ft. 49.56 lbs. per ft. $\frac{3}{8}$ in. Thick $\frac{7}{16}$ in. Thick $\frac{1}{2}$ in. Thick
250 to 350 Pounds	4 Diameters and Over	7 inches and Smaller 8 inches and Larger	Extra Strong $\frac{1}{2}$ in. Thick

PIPE

*Approximate Length of
Pipe in Quarter Bends
Exclusive of Tangents*

RADIUS INCHES	LENGTH INCHES	RADIUS INCHES	LENGTH INCHES	RADIUS INCHES	LENGTH INCHES	RADIUS INCHES	LENGTH INCHES
4	6 $\frac{1}{4}$	42	66	80	125 $\frac{3}{4}$	118	185 $\frac{1}{4}$
5	7 $\frac{3}{4}$	43	67 $\frac{1}{2}$	81	127 $\frac{1}{4}$	119	187
6	9 $\frac{1}{2}$	44	69 $\frac{1}{4}$	82	128 $\frac{3}{4}$	120	188 $\frac{1}{2}$
7	11	45	70 $\frac{3}{4}$	83	130 $\frac{1}{2}$	121	190
8	12 $\frac{1}{2}$	46	72 $\frac{1}{4}$	84	132	122	191 $\frac{1}{2}$
9	14 $\frac{1}{4}$	47	73 $\frac{3}{4}$	85	133 $\frac{1}{2}$	123	193 $\frac{1}{4}$
10	15 $\frac{3}{4}$	48	75 $\frac{1}{2}$	86	135	124	194 $\frac{3}{4}$
11	17 $\frac{1}{4}$	49	77	87	136 $\frac{3}{4}$	125	196 $\frac{1}{4}$
12	18 $\frac{3}{4}$	50	78 $\frac{1}{2}$	88	138 $\frac{1}{4}$	126	198
13	20 $\frac{1}{2}$	51	80	89	139 $\frac{3}{4}$	127	199 $\frac{1}{2}$
14	22	52	81 $\frac{3}{4}$	90	141 $\frac{1}{4}$	128	201
15	23 $\frac{1}{2}$	53	83 $\frac{1}{4}$	91	143	129	202 $\frac{3}{4}$
16	25 $\frac{1}{4}$	54	84 $\frac{3}{4}$	92	144 $\frac{1}{2}$	130	204 $\frac{1}{4}$
17	26 $\frac{3}{4}$	55	86 $\frac{1}{2}$	93	146	131	205 $\frac{3}{4}$
18	28 $\frac{1}{4}$	56	87 $\frac{1}{2}$	94	147 $\frac{3}{4}$	132	207 $\frac{1}{4}$
19	29 $\frac{3}{4}$	57	89 $\frac{1}{2}$	95	149 $\frac{1}{4}$	133	209
20	31 $\frac{1}{2}$	58	91	96	150 $\frac{3}{4}$	134	210 $\frac{1}{2}$
21	33	59	92 $\frac{3}{4}$	97	152 $\frac{1}{4}$	135	212
22	34 $\frac{1}{2}$	60	94 $\frac{1}{4}$	98	154	136	213 $\frac{3}{4}$
23	36 $\frac{1}{4}$	61	95 $\frac{3}{4}$	99	155 $\frac{1}{2}$	137	215 $\frac{1}{4}$
24	37 $\frac{3}{4}$	62	97 $\frac{1}{2}$	100	157	138	216 $\frac{3}{4}$
25	39 $\frac{1}{4}$	63	99	101	158 $\frac{3}{4}$	139	218 $\frac{1}{4}$
26	40 $\frac{3}{4}$	64	100 $\frac{1}{2}$	102	160 $\frac{1}{4}$	140	220
27	42 $\frac{1}{2}$	65	102	103	161 $\frac{3}{4}$	141	221 $\frac{1}{2}$
28	44	66	103 $\frac{3}{4}$	104	163 $\frac{1}{4}$	142	223
29	45 $\frac{1}{2}$	67	105 $\frac{1}{4}$	105	165	143	224 $\frac{3}{4}$
30	47 $\frac{1}{4}$	68	106 $\frac{3}{4}$	106	166 $\frac{1}{2}$	144	226 $\frac{1}{4}$
31	48 $\frac{3}{4}$	69	108 $\frac{1}{2}$	107	168	145	227 $\frac{3}{4}$
32	50 $\frac{1}{4}$	70	110	108	169 $\frac{3}{4}$	146	229 $\frac{1}{4}$
33	51 $\frac{3}{4}$	71	111 $\frac{1}{2}$	109	171 $\frac{1}{4}$	147	231
34	53 $\frac{1}{2}$	72	113	110	172 $\frac{3}{4}$	148	232 $\frac{1}{2}$
35	55	73	114 $\frac{1}{2}$	111	174 $\frac{1}{4}$	149	234
36	56 $\frac{1}{2}$	74	116 $\frac{1}{4}$	112	176	150	235 $\frac{1}{2}$
37	58 $\frac{1}{4}$	75	117 $\frac{3}{4}$	113	177 $\frac{1}{2}$	151	237 $\frac{1}{4}$
38	59 $\frac{3}{4}$	76	119 $\frac{1}{2}$	114	179	152	238 $\frac{3}{4}$
39	61 $\frac{1}{4}$	77	121	115	180 $\frac{3}{4}$	153	240 $\frac{1}{4}$
40	62 $\frac{3}{4}$	78	122 $\frac{1}{2}$	116	182 $\frac{1}{4}$	154	242
41	64 $\frac{1}{2}$	79	124	117	183 $\frac{3}{4}$	155	243 $\frac{1}{2}$

PIPE

Expansion Bends

Table Giving Expansion Cared For

The table below gives in inches the expansion cared for by quarter bends. These figures allow for a good safety factor.

Size of Pipe Inches	MEAN RADIUS OF BEND—INCHES												
	12	15	20	30	40	50	60	70	80	90	100	110	120
1	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{3}{4}$	$1\frac{3}{4}$	$3\frac{1}{8}$	.....	.....	.....	.....	.....	.....	.....	.....
2	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{1}{2}$	1	$1\frac{3}{4}$	$2\frac{3}{4}$	$3\frac{7}{8}$	$5\frac{3}{8}$	.....	.....	.....	.....	.....
2½	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{7}{8}$	$1\frac{1}{2}$	$2\frac{1}{4}$	$3\frac{1}{4}$	$4\frac{1}{2}$	$5\frac{3}{4}$	.....	.....	.....	.....
3	$\frac{1}{8}$	$\frac{3}{8}$	$\frac{5}{8}$	$1\frac{1}{8}$	$1\frac{7}{8}$	$2\frac{5}{8}$	$3\frac{5}{8}$	$4\frac{3}{4}$	6	.....	.....	.....
3½	$\frac{1}{4}$	$\frac{5}{8}$	1	$1\frac{5}{8}$	$2\frac{3}{8}$	$3\frac{1}{8}$	$4\frac{1}{8}$	$5\frac{1}{4}$	.....	.....	.....
4	$\frac{1}{4}$	$\frac{1}{2}$	1	$1\frac{1}{2}$	2	$2\frac{7}{8}$	$3\frac{3}{4}$	$4\frac{3}{4}$	$5\frac{3}{4}$	.....	.....
4½	$\frac{1}{2}$	$\frac{7}{8}$	$1\frac{3}{8}$	$1\frac{7}{8}$	$2\frac{1}{2}$	$3\frac{3}{8}$	$4\frac{1}{4}$	$5\frac{1}{4}$	.....	.....
5	$\frac{3}{8}$	$\frac{3}{4}$	$1\frac{1}{8}$	$1\frac{5}{8}$	$2\frac{1}{4}$	3	$3\frac{3}{4}$	$4\frac{5}{8}$	$5\frac{5}{8}$	.....
6	$\frac{3}{8}$	$\frac{5}{8}$	1	$1\frac{3}{8}$	$1\frac{7}{8}$	$2\frac{1}{2}$	$3\frac{1}{8}$	$3\frac{7}{8}$	$4\frac{3}{4}$	$5\frac{5}{8}$
8	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{2}$	$1\frac{7}{8}$	$2\frac{1}{2}$	3	$3\frac{5}{8}$	$4\frac{3}{8}$
10	$\frac{5}{8}$	$\frac{7}{8}$	$1\frac{1}{8}$	$1\frac{1}{2}$	2	$2\frac{3}{8}$	$2\frac{7}{8}$	$3\frac{1}{2}$
12	$\frac{3}{4}$	1	$1\frac{3}{8}$	$1\frac{5}{8}$	2	$2\frac{1}{2}$	$2\frac{7}{8}$
14	$\frac{7}{8}$	$1\frac{1}{8}$	$1\frac{3}{8}$	$1\frac{3}{4}$	$2\frac{1}{8}$	$2\frac{1}{2}$
15	1	$1\frac{3}{8}$	$1\frac{5}{8}$	2	$2\frac{3}{8}$
16	$\frac{7}{8}$	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{7}{8}$	$2\frac{1}{4}$
18	$1\frac{5}{8}$	$1\frac{7}{8}$
20	$1\frac{3}{4}$

The above figures are for No. 1 Quarter Bends.

For No. 7 U Bends, multiply expansion value by 2.

For No. 6 Single Offset Bends or No. 9 Expansion U Bends, multiply expansion values by 4.

For No. 10 Double Offset Bends or No. 11 Circle Bends, multiply expansion values by 5.

The expansion given in the above table does not take into consideration springing the bend when bolting into place. When bend is sprung, the expansion value will increase over value given in table an amount equal to the distance it is sprung.

PIPE

Expansion of Steam Pipes

The linear expansion and contraction of pipe, due to differences of temperature of the fluid carried and the surrounding air, must be cared for by suitable expansion joints or bends.

In order to determine the amount of expansion or contraction in a pipe line, we give below a table showing the increase in length of a pipe 100 feet long at various temperatures.

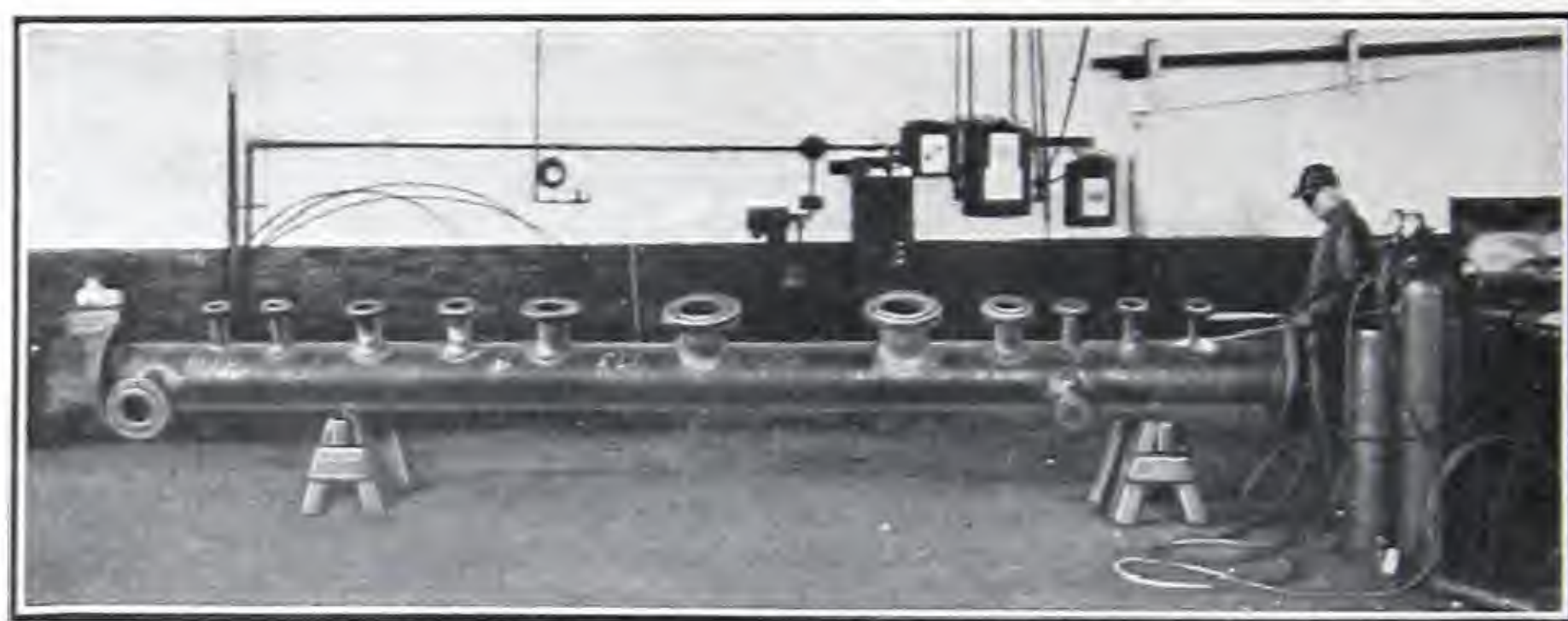
The expansion for any length of pipe may be found by taking the difference in increased length at the minimum and maximum temperatures, dividing by 100 and multiplying by the length in feet of the line under consideration.

EXPANSION OF PIPE

INCREASE IN LENGTH—INCHES PER 100 FEET

Temperature Degrees F.	Steel	Wrought Iron	Cast Iron	Brass and Copper
0	0	0	0	0
20	.15	.15	.10	.25
40	.30	.30	.25	.45
60	.45	.45	.40	.65
80	.60	.60	.55	.90
100	.75	.80	.70	1.15
120	.90	.95	.85	1.40
140	1.10	1.15	1.00	1.65
160	1.25	1.35	1.15	1.90
180	1.45	1.50	1.30	2.15
200	1.60	1.65	1.50	2.40
220	1.80	1.85	1.65	2.65
240	2.00	2.05	1.80	2.90
260	2.15	2.20	1.95	3.15
280	2.35	2.40	2.15	3.45
300	2.50	2.60	2.35	3.75
320	2.70	2.80	2.50	4.05
340	2.90	3.05	2.70	4.35
360	3.05	3.25	2.90	4.65
380	3.25	3.45	3.10	4.95
400	3.45	3.65	3.30	5.25
420	3.70	3.90	3.50	5.60
440	3.95	4.20	3.75	5.95
460	4.20	4.45	4.00	6.30
480	4.45	4.70	4.25	6.65
500	4.70	4.90	4.45	7.05
520	4.95	5.15	4.70	7.45
540	5.20	5.40	4.95	7.85
560	5.45	5.70	5.20	8.25
580	5.70	6.00	5.45	8.65
600	6.00	6.25	5.70	9.05
620	6.30	6.55	5.95	9.50
640	6.55	6.85	6.25	9.95
660	6.90	7.20	6.55	10.40
680	7.20	7.50	6.85	10.95
700	7.50	7.85	7.15	11.40
720	7.80	8.20	7.45	11.90
740	8.20	8.55	7.80	12.40
760	8.55	8.90	8.15	12.95
780	8.95	9.30	8.50	13.50
800	9.30	9.75	8.90	14.10

PIPE

Pipe Joints and Welded Headers

Typical Welded Header made in one of our plants

Grinnell Lap Joint
with Square ShoulderSectional View
Grinnell Lap JointGrinnell Lap Joint
with Round ShoulderScrewed
JointShrink
JointWelded
JointScrew and Welded
JointSargol
Joint

PIPE

Pipe Joints and Welded Headers

GRINNELL LAP JOINTS

Fabricated from Wrought Steel or Wrought Iron Pipe

Grinnell Lap Joints for Standard or Extra Heavy pipe are designed for any pressure and are made with either a round or square shoulder on the lap. They are made by rolling over the end of the pipe in front of the flange until it is at right angles to axis of the pipe. The lap is then faced on the front and on the edge and acts as a bearing surface for the gaskets in making the joint.

We also make Grinnell Lap Joints in which the minimum thickness of the lap after facing is equal to or greater than the normal thickness of the pipe, thereby making the lap much stronger than the pipe itself.

These joints can be used in connection with a flange of a fitting as well as two pieces of pipe. The hub of the flange is bored slightly larger than the outside diameter of the pipe so that the flange will swivel readily and accommodate itself to any slight variation in the position of the bolt holes.

GRINNELL SCREW JOINTS

The screwed flange joint is the least expensive of the various types shown. We thread the pipe and flanges accurately to American Briggs Standard gauge. The flange is then made on tight by special machinery. This type of joint gives universal satisfaction for standard and medium steam working pressures.

When so specified the flanges are screwed on by machine until the end of the pipe projects beyond the face of the flange, which insures a metal to metal joint. The end of pipe is then cut off flush with the face of flange and a light refacing cut taken across both the end of the pipe and the face of the flange, bringing the face of flange at 90 degrees with center line of the pipe. When a flange made on and finished in this way is bolted up, the gasket bears against both end of pipe and face of flange.

GRINNELL SHRINK JOINTS

The shrink flange joint was very popular for high pressure work before the introduction of the Lap and Weld types. The manufacturing process for this type is comparatively simple. We true up the pipe, bore the flange to a shrink fit and chamfer its bore. The flange is then heated to a red heat and while hot is slipped over the end of the pipe until the end of the pipe projects beyond the face of the flange. After the flange has partially cooled the end of the pipe is beaded into the chamfer and a light refacing cut is taken across both end of pipe and face of flange, bringing face of flange at 90 degrees with center line of the pipe. In this type of joint the gasket bears on both ends of pipe and face of flange.

WELDED FLANGE JOINT

The welded joint is made by heating both pipe and flange to a welding heat. The weld is then made by special machinery, which makes practically a hammer weld. The flange is then finished both on the face, edge and back.

The process gives a perfect union between flange and pipe. This joint should not be confused with that made by the Oxy-Acetylene or other processes. We have however complete facilities to furnish welded joints, headers, nozzles, and butt welds made by either the Oxy-Acetylene or Electric Welding processes.

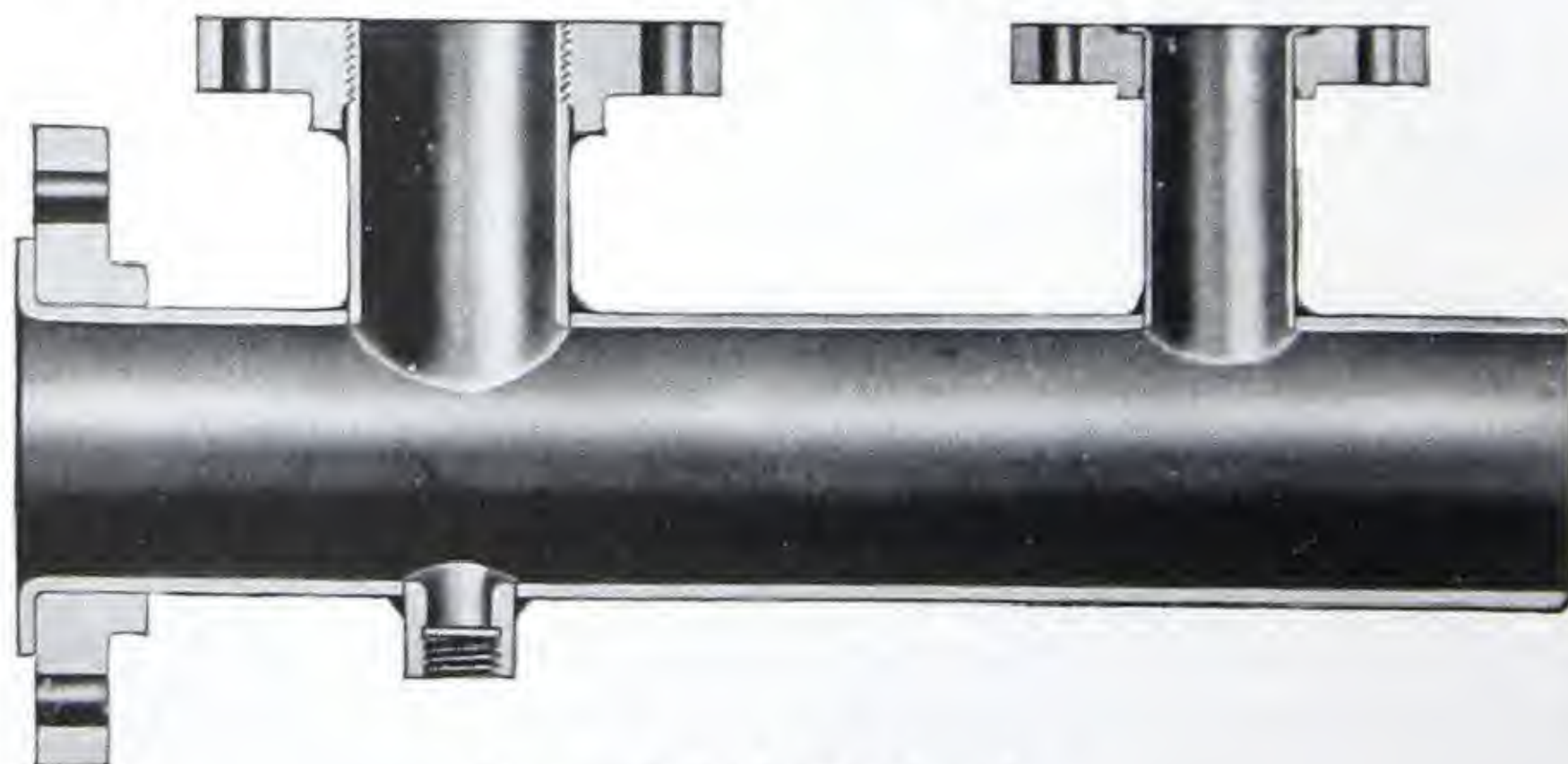
SCREW AND WELDED FLANGE JOINTS

In the screw and welded flange joint the flange face is chamfered at its bore and made on to pipe until the end of pipe projects beyond face of flange. The weld is then made in the chamfered recess provided in face of flange and when so specified can also be welded on back of flange. After the weld is made a light refacing cut is taken across both end of pipe and face of flange.

SARGOL JOINT

Another type of joint is the Sargol Joint which has a V shaped recess at the junction of the flange faces. This provides a means of welding the joint as illustrated. We are equipped to furnish valves, fittings, fabricated piping and pipe bends with flanges machined to make "Sargol Joints." This style of joint is patented and those who wish to use it should consult and arrange with owners of the patent.

Brass Pipe Joints and Welded Headers



Brass Welded Header

Illustrating types of joints referred to on following page.

PIPE

Brass Pipe Joints and Welded Headers

GRINNELL BRASS LAP JOINTS

In addition to our facilities for fabricating steel pipe, we are equipped to make Grinnell Lap Joints on brass pipe in Standard or Extra Heavy iron pipe sizes equipped with either steel or cast iron Lap Joint flanges. This type of joint is regularly specified and used for high pressure and for boiler feed water lines. This joint is furnished in sizes 3" and above.

SCREW AND BRAZE-WELD JOINTS

For marine work or where the danger of corrosion makes brass flanges necessary we furnish a Screw and Braze-Weld joint. This joint is made by making on the flange until the end of pipe projects beyond the face of flange. The end of pipe is then cut off flush with face of flange and flange is welded to pipe on face of flange or back of flange or both as the specification demands. A refacing cut is then taken across both ends of pipe and face of flange.

This type of joint can be furnished in either standard or extra heavy in all sizes up to 8-inch. Can also be furnished with steel flanges when so ordered.

BRAZE-WELD JOINT

Another type of Brass Braze-Weld Joint is made by boring the flange to a snug fit on the pipe and recessing its face as illustrated. The pipe is then lapped into the recess on face of flange and welded, after which a light refacing cut is taken across the flange. When so specified this type of joint is furnished braze-welded on both the face and back of flange. This type of joint can be furnished in either standard or extra heavy in sizes 2-inch to 8-inch inclusive and can also be furnished with steel flanges when so specified.

HEADERS, NOZZLES, ETC.

We are fully equipped to furnish Braze-Weld Brass Headers, Nozzles, Drip Bosses, etc., for all sizes, in Standard and Extra Heavy, with outlets fitted with any of the flange joints described above.

PIPE

Pipe Coils and BendsSpiral Coil
Fig. ASpiral Coil
Fig. BSpiral Coil
Fig. CWelded Return Bend Coil
Fig. DReturn Bend
Fig. EQuarter Bend
Fig. FGoose Necks
Fig. G

Prices on application.

See notes on opposite page.

PIPE

*Welded Pipe Coils, Small Pipe Bends, etc.
for all purposes*

*Made from
Steel or Brass Pipe — Brass or Copper Tubing*

In addition to our facilities for the fabrication of large pipe, bends, etc., we have at our various plants, departments equipped to furnish welded pipe coils and special small pipe bends in the various shapes called for, some of which are illustrated on the opposite page. We can furnish coils in any length by welding lengths of pipe together and bending in any practical shape.

Our equipment for this class of work insures uniformity in bends and exact fabrication to measurements and specifications.

A request for prices for bending or welding work of this kind should be accompanied by a sketch giving all necessary dimensions and a statement as to the service and kind of pipe or tubing required. We will be pleased to give our recommendations for any particular service or condition.



PIPE

Spiral Riveted Pressure Pipe



Use Galvanized Pipe for:	Use Galvanized or Asphalted Pipe for:
Exhaust Steam Pump Suction Brine Circulation Refrigerating Coils, Etc.	Paper and Pulp Mills Irrigation Pump Discharge Water Pipe Lines, Etc.

PLAIN ENDS WITHOUT FLANGES

Inside Diameter Inches	Thickness U.S. Std. Gauge	List Price Per Foot		App. Wt. Lbs. per ft. Asphalted	App. Burst- ing Strength per sq. in.
		Asphalt Coated	Galvan- ized		
3	18	\$.39	\$.53	2.3	2000
4	16	.52	.73	3.7	1875
5	16	.63	.88	4.5	1500
6	16	.74	1.04	5.3	1250
	14*	.87	1.21	6.6	1560
	12**	1.15	1.61	9.2	2170
7	16	.87	1.22	6.2	1070
	14*	1.01	1.41	7.7	1340
	12**	1.34	1.88	10.7	1860
8	16	1.00	1.40	7.1	935
	14*	1.16	1.62	8.8	1170
	12**	1.54	2.17	12.3	1640
9	16	1.12	1.56	8.0	835
	14*	1.30	1.81	9.9	1045
	12**	1.74	2.45	13.9	1460
10	16	1.24	1.73	8.8	750
	14*	1.45	2.01	11.0	935
	12**	1.91	2.69	15.3	1310
11	16	1.35	1.90	9.7	680
	14*	1.58	2.20	12.0	850
	12**	2.08	2.92	16.6	1200
12	16	1.48	2.07	10.6	625
	14*	1.72	2.40	13.0	780
	12**	2.27	3.19	18.2	1080
13	10	2.76	3.88	22.5	1410
	14	1.86	2.59	14.1	720
	12*	2.46	3.45	19.7	1010
	10**	2.99	4.22	24.5	1295

*Extra heavy.

**Double extra heavy.

Working pressure should not be more than 25 per cent of the ultimate strength or bursting pressure.

Above prices are for plain end pipe without flanges.

Lengths:—Standard (20 feet), or cut exactly to sketch. Galvanized not over 20 feet, Asphalted not over 40 feet.

PIPE

Spiral Riveted Pressure Pipe
(Continued)

PLAIN ENDS WITHOUT FLANGES

Inside Diameter Inches	Thickness U. S. Std. Gauge	List Price Per Foot		App. Wt. Lbs. per Ft. Asphalted	App. Burst- ing Strength per Sq. In.
		Asphalt Coated	Galvan- ized		
14	14	\$2.00	\$2.91	15.9	670
	12*	2.77	3.89	22.2	940
	10**	3.38	4.75	27.6	1210
15	14	2.17	3.12	17.0	625
	12*	2.97	4.16	23.7	875
	10**	3.62	5.10	29.6	1125
16	14	2.36	3.33	18.1	585
	12*	3.15	4.43	25.2	820
	10**	3.85	5.42	31.5	1050
18	8	4.66	6.54	38.1	1290
	6	5.47	7.67	44.7	1520
	14	2.63	3.66	19.9	520
20	12*	3.40	4.84	27.6	730
	10**	4.22	5.95	34.5	940
	8	5.09	7.16	41.6	1140
22	6	6.00	8.41	49.0	1360
	14	2.92	4.06	22.1	470
	12*	3.82	5.37	30.6	660
24	10**	4.68	6.59	38.3	840
	8	5.65	7.94	46.2	1030
	6	6.62	9.28	54.1	1220
26	12	4.21	5.91	33.7	595
	10*	5.15	7.26	42.2	765
	8**	6.22	8.73	50.8	940
28	6	7.28	10.21	59.5	1108
	12	4.47	6.41	36.5	540
	10*	5.59	7.88	45.7	705
30	8**	6.75	9.48	55.2	820
	6	7.90	11.09	64.6	1015

*Extra heavy.

**Double extra heavy.

Working pressure should not be more than 25 per cent of the ultimate strength or bursting pressure.

GRINNELL CAST IRON FITTINGS

Standard Screwed Fittings

For Steam Working Pressures Up To 125 Lbs.

For Water Working Pressures Up To 175 Lbs.

Grinnell Cast Iron Screwed Fittings meet every demand for a high grade fitting, in design, utility and strength.

Grinnell Cast Iron Screwed Fittings are tapped straight and accurately to the American Briggs Standard, all fittings are chamfered, permitting an easy entrance of the pipe.

INCREASED VARIETY OF SIZES

We believe the large variety of straight and reducing sizes tabulated on pages 55 to 62 will be found sufficient to meet the demands of the trade.

Should sizes be required not given in tabulation referred to above, we advise the use of bushings.

Where it is necessary to have special fittings made without the use of bushings we will, upon receipt of inquiry, quote prices. Unless the inquiry calls for large quantities, special fittings are expensive.

GALVANIZED FITTINGS

Such fittings as are listed on pages 55 to 61. Fast moving sizes only are carried in stock galvanized. Other sizes galvanized to order only.

TESTED FITTINGS

Fittings tested to 100 pounds air pressure or 250 pounds water pressure will be made to order. Prices according to quantity wanted. Please specify whether these fittings are to be used for steam, water, gas or air.

GRINNELL CAST IRON FITTINGS

Elbows

125 Lbs. Steam Pressure

175 Lbs. Water Pressure

Elbow, Straight
Fig. No. 351Elbow, Reducing
Fig. No. 352Elbow, R. and L.
Fig. No. 353Elbow, Pitched
Fig. No. 354Elbow, 45°
Fig. No. 356

ELBOWS—Fig. Nos. 351, 353, 354, 356

Size	Inches	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3
R. H., Fig. No. 351 .....		.05	.05	.06	.08	.10 1/2	.16	.20	.28	.50	.75
R. and L., Fig. No. 353 ..		.06	.06	.07	.09	.12	.18	.23	.32	.60	.85
Pitched, Fig. No. 35410	.13	.20	.25	.35	.65	1.00
45° Elbow, Fig. No. 356..		.06	.06	.07	.10	.12	.19	.24	.34	.60	.90
Size	Inches	3 1/2	4	4 1/2	5	6	7	8	9	10	12
R. H., Fig. No. 351		1.05	1.20	1.75	2.00	2.75	4.70	6.75	9.00	13.50	20.00
R. and L., Fig. No. 353 ..		1.20	1.45	...	...	...	...	...	...	...	...
Pitched, Fig. No. 354		1.30	1.50	2.25	3.00	4.00	...	...	...	...	...
45° Elbow, Fig. No. 356..		1.25	1.45	2.20	2.50	3.45	5.90	8.50	11.25	17.00	25.00

ELBOWS, REDUCING—Fig. Nos. 352, 355

Size	Inches	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2
Regular, Fig. No. 352 ....		.06	.07	.09	.12	.18	.23	.32	.60	.85	1.20
Pitched, Fig. No. 35510	.13	.20	.25	.35	.65	1.00	1.30
Size	Inches	4	4 1/2	5	6	7	8	9	10	12	...
Regular, Fig. No. 352		1.40	2.00	2.30	3.15	5.40	7.75	10.50	15.50	23.00	...

Pitched Elbows are Tapped to pitch 1/4 inch in 1 foot.

For galvanized, double above list.

The letter "P" cast on body denotes Pitched Elbow.

The letter "L" cast on body near band of Right and Left Elbows denotes the Left Hand Thread.

Order by Figure Number.

GRINNELL CAST IRON FITTINGS

Tees — Crosses

125 Lbs. Steam Pressure

175 Lbs. Water Pressure

Straight Tee
Fig. No. 358Reducing Tees
Fig. No. 359Straight Cross
Fig. No. 360Reducing Cross
Fig. No. 361

TEES, STRAIGHT — Fig. No. 358

Size.....Inches	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3
Price.....Each	.08	.08	.09	.12	.15	.23	.29	.41	.73	1.10
Size.....Inches	3 1/2	4	4 1/2	5	6	7	8	9	10	12
Price.....Each	1.50	1.75	2.55	3.00	4.00	6.80	9.75	13.00	19.50	29.00

TEES, REDUCING — Fig. No. 359

Size.....Inches	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2
Price.....Each	.09	.10	.14	.17	.27	.33	.47	.83	1.25	1.75
Size.....Inches	4	4 1/2	5	6	7	8	9	10	12	
Price.....Each	2.00	2.95	3.50	4.60	7.80	11.25	15.00	22.50	33.50	

CROSSES, STRAIGHT — Fig. No. 360

Size.....Inches	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3
Price.....Each	.15	.15	.16	.22	.27	.42	.53	.75	1.30	2.00
Size.....Inches	3 1/2	4	4 1/2	5	6	7	8	9	10	12
Price.....Each	2.70	3.15	4.60	5.50	7.25	12.25	17.50	23.50	35.00	52.50

CROSSES, REDUCING — Fig. No. 361

Size.....Inches	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	
Price.....Each	.18	.25	.30	.46	.60	.83	1.45	2.20	3.00	
Size.....Inches	4	4 1/2	5	6	7	8	9	10	12	
Price.....Each	3.50	5.10	6.00	8.00	13.50	19.25	26.00	38.50	58.00	

For galvanized, double above lists.
Order by Figure Number.

GRINNELL CAST IRON FITTINGS

Side Outlet Fittings—Reducers—Couplings

125 Lbs. Steam Pressure

175 Lbs. Water Pressure

Side Outlet Elbow
Fig. No. 363Side Outlet Tee
Fig. No. 364

ELBOWS, SIDE OUTLET—Fig. No. 363

Size.....Inches	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	4	5	6
Straight.....Each	.18	.24	.30	.48	.60	.84	1.50	2.25	3.60	6.00	8.25
Reducing.....Each	.21	.28	.35	.55	.68	.96	1.70	2.58	4.00	6.90	9.45

TEES, SIDE OUTLET—Fig. No. 364

Size.....Inches	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	4	5	6
Straight.....Each	.27	.36	.45	.70	.90	1.25	2.25	3.25	5.25	9.00	12.00
Reducing.....Each	.31	.42	.52	.80	1.00	1.45	2.58	3.73	6.00	10.35	13.80

Reducer
Fig. No. 367Eccentric Reducer
Fig. No. 368Coupling
Fig. No. 369

REDUCERS—Fig. No. 367

Size.....Inches	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4
Price.....Each	.10	.16	.22	.28	.43	.60	.80	1.00	1.35
Size.....Inches	4 1/2	5	6	7	8	9	10	12	....
Price.....Each	1.85	2.00	2.70	5.35	6.75	8.35	10.00	15.00	....

ECCENTRIC REDUCERS—Fig. No. 368

Size.....Inches	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4
Price.....Each	.55	.55	.72	1.00	1.50	2.40	3.00	4.00
Size.....Inches	4 1/2	5	6	7	8	9	10	12
Price.....Each	5.00	6.00	8.00	9.00	11.00	12.50	14.00	18.00

STRAIGHT C. I. COUPLINGS—Fig. No. 369

Size.....Inches	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4	5	6
Right Hand.....Each	.30	.45	.55	.80	1.10	1.50	2.00	4.00	5.00

For galvanized, double above lists.
Order by Figure Number.

GRINNELL CAST IRON FITTINGS

Elbows — Y's

125 Lbs. Steam Pressure

175 Lbs. Water Pressure



Elbow, Flange and Screw
Fig. No. 371



45° Elbow, Flange and Screw
Fig. No. 372



Y's, Screw
Fig. No. 373



Y's, Flange and Screw
Fig. No. 374

ELBOWS, FLANGE AND SCREW—Fig. No. 371

Size.....Inches	2½	3	3½	4	5	6	7	8
Price.....Each	1.60	2.00	2.60	3.00	4.05	5.25	7.95	10.55

45° ELBOWS, FLANGE AND SCREW—Fig. No. 372

Size.....Inches	2½	3	3½	4	5	6	7	8
Price.....Each	1.70	2.15	2.80	3.25	4.55	5.95	9.15	12.30

Y'S, SCREW—Fig. No. 373

Size.....Inches	½	¾	1	1½	1½	2	2½
Straight.....Each	.20	.28	.34	.54	.66	.94	1.66
Reducing.....Each	.23	.33	.40	.62	.76	1.08	1.90

Size.....Inches	3	3½	4	4½	5	6	8
Straight.....Each	2.50	3.50	4.00	5.90	7.00	9.20	22.50
Reducing.....Each	2.90	4.00	4.60	6.80	8.00	10.60	26.00

Y'S, FLANGE AND SCREW—Fig. No. 374

Size.....Inches	4	5	6	8
Price.....Each	5.80	9.05	11.70	26.30

For galvanized, double above lists.
Reducing Y's are made from straight size patterns.
Order by Figure Number.

GRINNELL CAST IRON FITTINGS

Return Bends

125 Lbs. Steam Pressure

175 Lbs. Water Pressure

Close Pattern
Fig. No. 375Open Pattern
Fig. No. 376Special Wide Pattern
Fig. No. 377

RETURN BENDS, CLOSE PATTERN — Fig. No. 375

Size.....Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Price, R. H.....Each	.18	.20	.22	.28	.40	.57	1.20	1.70
" R. & L....."	.21	.23	.26	.33	.46	.66	1.40	1.95
" L. H....."	.21	.23	.26	.33	.46	.66	1.40	1.95
" R. H. Pitched....."	...	.23	.26	.33	...	...	...	...
" R. & L. or L. H. Pitched.."	...	.23	.26	.33	...	...	...	...
Center to Center.....Inches	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	$2\frac{3}{16}$	$2\frac{1}{2}$	3	$3\frac{3}{4}$	$4\frac{1}{4}$

RETURN BENDS, OPEN PATTERN — Fig. No. 376

Size.....Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Price, R. H.....Each	.25	.26	.30	.40	.55	.80	1.35	2.20
" R. & L....."	.30	.30	.35	.46	.64	.92	1.55	2.50
" L. H....."	.30	.30	.35	.46	.64	.92	1.55	2.50
Center to Center.....Inches	2	$2\frac{1}{4}$	$2\frac{1}{2}$	3	$3\frac{1}{2}$	$4\frac{1}{2}$	6	$6\frac{1}{2}$

RETURN BENDS, SPECIAL WIDE PATTERN — Fig. No. 377

Size.....Inches	1	1	$1\frac{1}{4}$	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$
Price, Black.....Each	.50	.60	1.00	1.25	1.60	2.00	2.00	5.50
" Galvanized....."	.90	1.10	1.75	2.00	2.60	3.25	3.25	9.00
Center to Center.....Inches	4	5	$4\frac{1}{2}$	6	6	$7\frac{1}{2}$	6	8

Return Bends not listed will be furnished at special net prices.

Right and Left and Left Hand Pitched Return Bends are made to order.

Special Wide Pattern Return Bends are stocked $1\frac{1}{4}$ and 2 inches with 6 inch centers.

Other sizes are made to order.

Order by Figure Number.

GRINNELL CAST IRON FITTINGS

Return Bends—Caps—Locknuts

125 Lbs. Steam Pressure

175 Lbs. Water Pressure



Return Bend, Back Outlet

RETURN BENDS, CLOSE PATTERN, BACK OUTLET

Fig. No. 378

Size.....Inches	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Price, Right Hand.....Each	.38	.42	.60	.80	1.15	2.00	3.00
Price, Right and Left..Each	.42	.48	.70	.95	1.30	2.30	3.50
Center to Center.....Inches	$1\frac{1}{2}$	$1\frac{3}{4}$	$2\frac{3}{8}$	$2\frac{1}{2}$	3	$3\frac{3}{4}$	$4\frac{1}{4}$

RETURN BENDS, OPEN PATTERN, BACK OUTLET

Fig. No. 379

Size.....Inches	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Price, Right Hand.....Each	.38	.42	.60	.80	1.15	2.00	3.00
Price, Right and Left..Each	.42	.48	.70	.95	1.30	2.30	3.50
Center to Center.....Inches	$2\frac{1}{4}$	$2\frac{1}{2}$	3	$3\frac{1}{2}$	$4\frac{1}{2}$	6	$6\frac{1}{2}$

C. I. Cap
Fig. No. 381C. I. Locknut
Fig. No. 382

C. I. CAP—Fig. No. 381

Size.....Inches	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5
Price.....Each	.40	.54	.75	.87	1.05	1.20
Size.....Inches	6	7	8	9	10	12
Price.....Each	1.55	2.50	2.85	4.75	5.50	7.00

C. I. LOCKNUT—Fig. No. 382

Size.....Inches	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4
Price.....Each	.27	.34	.47	.64

For galvanized, double above lists.
 For Caps smaller than $2\frac{1}{2}$ "', see Mall. Iron Fittings.
 For Locknuts smaller than $2\frac{1}{2}$ "', see Mall. Iron Fittings.
 Order by Figure Number.

GRINNELL CAST IRON FITTINGS

BushingsHex Bushing
Fig. No. 383Hex Bushing
Fig. No. 384Face Bushing
Fig. No. 385Eccentric Bushing
Fig. No. 386

HEX BUSHINGS—Fig. Nos. 383, 384

Size.....Inches	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$
Price.....Each	.04	.04	.05	.06	.07	.09	.14	.21	.30	.40
Size.....Inches	4	$4\frac{1}{2}$	5	6	7	8	9	10	12	...
Price.....Each	.50	.75	.93	1.25	1.87	2.75	3.25	3.75	5.00	...

FACE BUSHINGS—Fig. No. 385

Size.....Inches	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$
Price, Black.....Each	.08	.09	.11	.13	.17	.22	.32	.48
Price, Galvanized.....Each	.12	.14	.17	.20	.25	.33	.48	.72
Size.....Inches	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	6	7	8
Price, Black.....Each	.70	1.20	1.50	2.10	2.60	3.75	8.00	9.00
Price, Galvanized.....Each	1.05	1.80	2.25	3.15	3.90	5.60	....	....

ECCENTRIC BUSHINGS—Fig. No. 386

Size.....Inches	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	6
Price.....Each	.22	.25	.27	.42	.60	.80	1.00	1.50	1.85	2.50

For Galvanized Hex and Eccentric Bushings, double above lists.
Order by Figure Number.

GRINNELL CAST IRON FITTINGS

Plugs

Square Head Plug Cored
Fig. No. 387



Square Head Plug Solid
Fig. No. 388



Slotted or Bar Type
Fig. No. 389



Countersunk Plug
Fig. No. 390

SQUARE HEAD PLUGS—Fig. No. 387

Size.....Inches	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
R. H.....Each	.02	.02	.02	.02	.03	.04	.05	.07	.10	.18	.25
L. H.....Each	...	...	...	.04	.06	.08	.09	.11	.15	...	...
Size.....Inches	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	6	7	8	9	10	12	...
R. H.....Each	.38	.42	.65	.88	1.20	1.85	2.75	3.25	3.75	5.00	...

SQUARE HEAD PLUGS, SOLID—Fig. No. 388

Size.....Inches	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Price.....Each	.04	.04	.04	.04	.06	.08	.09	.11	.15	.27	.38
Size.....Inches	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	6	7	8	9	10	12	...
Price.....Each	.57	.63	1.00	1.35	1.80	2.80	4.15	5.00	5.75	7.50	...

SLOTTED OR BAR TYPE PLUGS (Cored)—Fig. No. 389

Size.....Inches	4	$4\frac{1}{2}$	5	6	7	8	9	10	12
Price.....Each	.42	.65	.88	1.20	1.85	2.75	3.25	3.75	5.00

COUNTERSUNK PLUGS—Fig. No. 390

Size.....Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	5	6
Price.....Each	.04	.06	.08	.09	.11	.15	.30	.40	.92	1.10	2.00	3.50

For galvanized, double above lists.
Order by Figure Number.

LIST OF SIZES

Standard Cast Iron Fittings

Sizes differing from Standard Sizes, if furnished, will be charged at special net prices.

ELBOWS—STRAIGHT SIZES

Screw.....	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Flange and Screw.....	...	...	...	...	...	...	...	...	$2\frac{1}{2}$	3
Screw.....	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	6	7	8	9	10	12
Flange and Screw.....	$3\frac{1}{2}$	4	...	5	6	7	8	...	...	...

ELBOWS—REDUCING SIZES

$\frac{3}{8} \times \frac{1}{4}$	$1\frac{1}{4} \times \frac{3}{4}$	2 x $\frac{3}{4}$	3 x $1\frac{1}{4}$	4 x 2	6 x $3\frac{1}{2}$
$\frac{1}{2} \times \frac{3}{8}$	$1\frac{1}{4} \times \frac{1}{2}$	2 x $\frac{1}{2}$	3 x 1	4 x $1\frac{1}{2}$	6 x 3
$\frac{1}{2} \times \frac{1}{4}$	$1\frac{1}{4} \times \frac{3}{8}$	$2\frac{1}{2} \times 2$	$3\frac{1}{2} \times 3$	$4\frac{1}{2} \times 4$	7 x 6
$\frac{3}{4} \times \frac{1}{2}$	$1\frac{1}{2} \times 1\frac{1}{4}$	$2\frac{1}{2} \times 1\frac{1}{2}$	$3\frac{1}{2} \times 2\frac{1}{2}$	5 x $4\frac{1}{2}$	8 x 7
$\frac{3}{4} \times \frac{3}{8}$	$1\frac{1}{2} \times 1$	$2\frac{1}{2} \times 1\frac{1}{4}$	$3\frac{1}{2} \times 2$	5 x 4	8 x 6
$\frac{3}{4} \times \frac{1}{4}$	$1\frac{1}{2} \times \frac{3}{4}$	$2\frac{1}{2} \times 1$	$3\frac{1}{2} \times 1\frac{1}{2}$	5 x $3\frac{1}{2}$	10 x 8
1 x $\frac{3}{4}$	$1\frac{1}{2} \times \frac{1}{2}$	$2\frac{1}{2} \times \frac{3}{4}$	$3\frac{1}{2} \times 1\frac{1}{4}$	5 x 3	.....
1 x $\frac{1}{2}$	2 x $1\frac{1}{2}$	3 x $2\frac{1}{2}$	4 x $3\frac{1}{2}$	5 x $2\frac{1}{2}$	.....
1 x $\frac{3}{8}$	2 x $1\frac{1}{4}$	3 x 2	4 x 3	6 x 5	.....
$1\frac{1}{4} \times 1$	2 x 1	3 x $1\frac{1}{2}$	4 x $2\frac{1}{2}$	6 x 4	.....

45° ELBOWS

Screw	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Flange and Screw.....	...	...	...	...	...	...	...	...	$2\frac{1}{2}$	3
Screw	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	6	7	8	9	10	12
Flange and Screw.....	$3\frac{1}{2}$	4	...	5	6	...	8	...	...	...

RIGHT AND LEFT ELBOWS—STRAIGHT SIZES

Straight Sizes	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
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PITCHED ELBOWS—STRAIGHT SIZES

Straight Sizes	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4
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PITCHED ELBOWS—REDUCING SIZES

Reducing Sizes	$\frac{3}{4} \times \frac{1}{2}$	$1 \times \frac{3}{4}$	$1\frac{1}{4} \times 1$	$1\frac{1}{2} \times 1\frac{1}{4}$	$1\frac{1}{2} \times 1$
Reducing Sizes	$2 \times 1\frac{1}{2}$	$2\frac{1}{2} \times 2$	$3 \times 2\frac{1}{2}$	$3\frac{1}{2} \times 3$	

SIDE OUTLET ELBOWS

Straight Sizes.....	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	4	5	6
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SIDE OUTLET TEES

Straight Sizes.....	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	4	5	6
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LIST OF SIZES

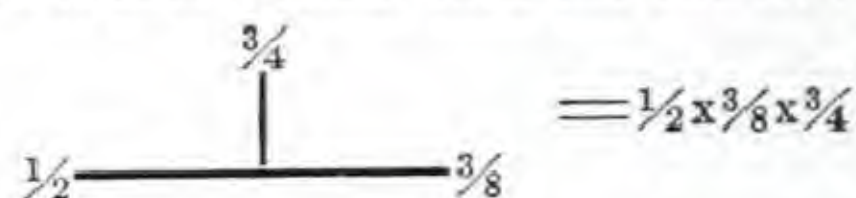
Standard Cast Iron Fittings

TEES — STRAIGHT SIZES

Straight Sizes.....	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Straight Sizes.....	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	6	7	8	9	10	12

TEES — REDUCING SIZES

In describing tees, the run is first named, then the outlet, thus:



$\frac{3}{8} \times \frac{3}{8} \times \frac{1}{4}$	1 x $\frac{3}{4} \times \frac{3}{4}$	1 x $\frac{1}{2} \times 1\frac{1}{4}$	$1\frac{1}{4} \times 1\frac{1}{4} \times 1\frac{1}{2}$	2 x $\frac{3}{4} \times 2$
$\frac{3}{8} \times \frac{1}{4} \times \frac{3}{8}$	1 x $\frac{3}{4} \times \frac{1}{2}$	$\frac{3}{4} \times \frac{3}{4} \times 1\frac{1}{4}$	$1\frac{1}{4} \times 1 \times 1\frac{1}{2}$	2 x $\frac{3}{4} \times 1\frac{1}{2}$
$\frac{3}{8} \times \frac{1}{4} \times \frac{1}{4}$	1 x $\frac{1}{2} \times 1$	$\frac{3}{4} \times \frac{1}{2} \times 1\frac{1}{4}$	$1\frac{1}{4} \times \frac{3}{4} \times 1\frac{1}{2}$	2 x $\frac{3}{4} \times 1\frac{1}{4}$
$\frac{1}{4} \times \frac{1}{4} \times \frac{3}{8}$	1 x $\frac{1}{2} \times \frac{3}{4}$	$1\frac{1}{2} \times 1\frac{1}{2} \times 1\frac{1}{4}$	$1\frac{1}{4} \times \frac{1}{2} \times 1\frac{1}{2}$	2 x $\frac{3}{4} \times 1$
$\frac{1}{2} \times \frac{1}{2} \times \frac{3}{8}$	1 x $\frac{1}{2} \times \frac{1}{2}$	$1\frac{1}{2} \times 1\frac{1}{2} \times 1$	1 x $1 \times 1\frac{1}{2}$	2 x $\frac{3}{4} \times \frac{3}{4}$
$\frac{1}{2} \times \frac{1}{2} \times \frac{1}{4}$	1 x $\frac{3}{8} \times 1$	$1\frac{1}{2} \times 1\frac{1}{2} \times \frac{3}{4}$	1 x $\frac{3}{4} \times 1\frac{1}{2}$	2 x $\frac{3}{4} \times \frac{1}{2}$
$\frac{1}{2} \times \frac{3}{8} \times \frac{1}{2}$	1 x $\frac{1}{4} \times 1$	$1\frac{1}{2} \times 1\frac{1}{2} \times \frac{1}{2}$	$\frac{3}{4} \times \frac{3}{4} \times 1\frac{1}{2}$	2 x $\frac{1}{2} \times 2$
$\frac{1}{2} \times \frac{3}{8} \times \frac{3}{8}$	$\frac{3}{4} \times \frac{3}{4} \times 1$	$1\frac{1}{2} \times 1\frac{1}{2} \times \frac{3}{8}$	2 x $2 \times 1\frac{1}{2}$	2 x $\frac{1}{2} \times 1\frac{1}{2}$
$\frac{1}{2} \times \frac{1}{4} \times \frac{1}{2}$	$\frac{3}{4} \times \frac{1}{2} \times 1$	$1\frac{1}{2} \times 1\frac{1}{2} \times \frac{1}{4}$	2 x $2 \times 1\frac{1}{4}$	2 x $\frac{1}{2} \times 1\frac{1}{4}$
$\frac{1}{2} \times \frac{1}{4} \times \frac{1}{4}$	$\frac{1}{2} \times \frac{1}{2} \times 1$	$1\frac{1}{2} \times 1\frac{1}{4} \times 1\frac{1}{2}$	2 x 2×1	2 x $\frac{1}{2} \times \frac{1}{2}$
$\frac{3}{8} \times \frac{3}{8} \times \frac{1}{2}$	$1\frac{1}{4} \times 1\frac{1}{4} \times 1$	$1\frac{1}{2} \times 1\frac{1}{4} \times 1\frac{1}{4}$	2 x $2 \times \frac{3}{4}$	2 x $\frac{3}{8} \times 2$
$\frac{1}{4} \times \frac{1}{4} \times \frac{1}{2}$	$1\frac{1}{4} \times 1\frac{1}{4} \times \frac{3}{4}$	$1\frac{1}{2} \times 1\frac{1}{4} \times 1$	2 x $2 \times \frac{1}{2}$	2 x $\frac{1}{4} \times 2$
$\frac{3}{4} \times \frac{3}{4} \times \frac{1}{2}$	$1\frac{1}{4} \times 1\frac{1}{4} \times \frac{1}{2}$	$1\frac{1}{2} \times 1\frac{1}{4} \times \frac{3}{4}$	2 x $2 \times \frac{3}{8}$	$1\frac{1}{2} \times 1\frac{1}{2} \times 2$
$\frac{3}{4} \times \frac{3}{4} \times \frac{3}{8}$	$1\frac{1}{4} \times 1\frac{1}{4} \times \frac{3}{8}$	$1\frac{1}{2} \times 1\frac{1}{4} \times \frac{1}{2}$	2 x $2 \times \frac{1}{4}$	$1\frac{1}{2} \times 1\frac{1}{4} \times 2$
$\frac{3}{4} \times \frac{3}{4} \times \frac{1}{4}$	$1\frac{1}{4} \times 1\frac{1}{4} \times \frac{1}{4}$	$1\frac{1}{2} \times 1 \times 1\frac{1}{2}$	2 x $1\frac{1}{2} \times 2$	$1\frac{1}{2} \times 1 \times 2$
$\frac{3}{4} \times \frac{1}{2} \times \frac{3}{4}$	$1\frac{1}{4} \times 1 \times 1\frac{1}{4}$	$1\frac{1}{2} \times 1 \times 1\frac{1}{4}$	2 x $1\frac{1}{2} \times 1\frac{1}{2}$	$1\frac{1}{2} \times \frac{3}{4} \times 2$
$\frac{3}{4} \times \frac{1}{2} \times \frac{1}{2}$	$1\frac{1}{4} \times 1 \times 1$	$1\frac{1}{2} \times 1 \times 1$	2 x $1\frac{1}{2} \times 1\frac{1}{4}$	$1\frac{1}{4} \times 1\frac{1}{4} \times 2$
$\frac{3}{4} \times \frac{1}{2} \times \frac{3}{8}$	$1\frac{1}{4} \times 1 \times \frac{3}{4}$	$1\frac{1}{2} \times 1 \times \frac{3}{4}$	2 x $1\frac{1}{2} \times 1$	$1\frac{1}{4} \times 1 \times 2$
$\frac{3}{4} \times \frac{1}{2} \times \frac{1}{4}$	$1\frac{1}{4} \times 1 \times \frac{1}{2}$	$1\frac{1}{2} \times 1 \times \frac{1}{2}$	2 x $1\frac{1}{2} \times \frac{3}{4}$	$1\frac{1}{4} \times \frac{3}{4} \times 2$
$\frac{3}{4} \times \frac{3}{8} \times \frac{3}{4}$	$1\frac{1}{4} \times \frac{3}{4} \times 1\frac{1}{4}$	$1\frac{1}{2} \times \frac{3}{4} \times 1\frac{1}{2}$	2 x $1\frac{1}{2} \times \frac{1}{2}$	1 x 1×2
$\frac{3}{4} \times \frac{3}{8} \times \frac{1}{2}$	$1\frac{1}{4} \times \frac{3}{4} \times 1$	$1\frac{1}{2} \times \frac{3}{4} \times 1\frac{1}{4}$	2 x $1\frac{1}{4} \times 2$	1 x $\frac{3}{4} \times 2$
$\frac{3}{4} \times \frac{3}{8} \times \frac{3}{8}$	$1\frac{1}{4} \times \frac{3}{4} \times \frac{3}{4}$	$1\frac{1}{2} \times \frac{3}{4} \times 1$	2 x $1\frac{1}{4} \times 1\frac{1}{2}$	$\frac{3}{4} \times \frac{3}{4} \times 2$
$\frac{3}{4} \times \frac{1}{4} \times \frac{3}{4}$	$1\frac{1}{4} \times \frac{3}{4} \times \frac{1}{2}$	$1\frac{1}{2} \times \frac{3}{4} \times \frac{3}{4}$	2 x $1\frac{1}{4} \times 1\frac{1}{4}$	$2\frac{1}{2} \times 2\frac{1}{2} \times 2$
$\frac{3}{4} \times \frac{1}{4} \times \frac{1}{2}$	$1\frac{1}{4} \times \frac{1}{2} \times 1\frac{1}{4}$	$1\frac{1}{2} \times \frac{3}{4} \times \frac{1}{2}$	2 x $1\frac{1}{4} \times 1$	$2\frac{1}{2} \times 2\frac{1}{2} \times 1\frac{1}{2}$
$\frac{1}{2} \times \frac{1}{2} \times \frac{3}{4}$	$1\frac{1}{4} \times \frac{1}{2} \times 1$	$1\frac{1}{2} \times \frac{1}{2} \times 1\frac{1}{2}$	2 x $1\frac{1}{4} \times \frac{3}{4}$	$2\frac{1}{2} \times 2\frac{1}{2} \times 1\frac{1}{4}$
$\frac{3}{8} \times \frac{3}{8} \times \frac{3}{4}$	$1\frac{1}{4} \times \frac{1}{2} \times \frac{3}{4}$	$1\frac{1}{2} \times \frac{1}{2} \times 1\frac{1}{4}$	2 x $1\frac{1}{4} \times \frac{1}{2}$	$2\frac{1}{2} \times 2\frac{1}{2} \times 1$
1 x $1 \times \frac{3}{4}$	$1\frac{1}{4} \times \frac{1}{2} \times \frac{1}{2}$	$1\frac{1}{2} \times \frac{1}{2} \times 1$	2 x 1×2	$2\frac{1}{2} \times 2\frac{1}{2} \times \frac{3}{4}$
1 x $1 \times \frac{1}{2}$	$1\frac{1}{4} \times \frac{3}{8} \times 1\frac{1}{4}$	$1\frac{1}{2} \times \frac{1}{2} \times \frac{3}{4}$	2 x $1 \times 1\frac{1}{2}$	$2\frac{1}{2} \times 2\frac{1}{2} \times \frac{1}{2}$
1 x $1 \times \frac{3}{8}$	$1\frac{1}{4} \times \frac{1}{4} \times 1\frac{1}{4}$	$1\frac{1}{2} \times \frac{1}{2} \times \frac{1}{2}$	2 x $1 \times 1\frac{1}{4}$	.....
1 x $1 \times \frac{1}{4}$	1 x $1 \times 1\frac{1}{4}$	$1\frac{1}{2} \times \frac{3}{8} \times 1\frac{1}{2}$	2 x 1×1	.....
1 x $\frac{3}{4} \times 1$	1 x $\frac{3}{4} \times 1\frac{1}{4}$	$1\frac{1}{2} \times \frac{1}{4} \times 1\frac{1}{2}$	2 x $1 \times \frac{3}{4}$	.....

LIST OF SIZES

Standard Cast Iron Fittings

TEES — REDUCING SIZES — Continued

$2\frac{1}{2} \times 2$	$x 2\frac{1}{2}$	3	$x 3$	$x 1$	$3\frac{1}{2} \times 3\frac{1}{2} \times 2$	4	$x 4$	$x 2$	4	$x 1$	$x 4$		
$2\frac{1}{2} \times 2$	$x 2$	3	$x 3$	$x \frac{3}{4}$	$3\frac{1}{2} \times 3\frac{1}{2} \times 1\frac{1}{2}$	4	$x 4$	$x 1\frac{1}{2}$	4	$x \frac{3}{4} \times 4$			
$2\frac{1}{2} \times 2$	$x 1\frac{1}{2}$	3	$x 3$	$x \frac{1}{2}$	$3\frac{1}{2} \times 3\frac{1}{2} \times 1\frac{1}{4}$	4	$x 4$	$x 1\frac{1}{4}$	$3\frac{1}{2} \times 3\frac{1}{2} \times 4$				
$2\frac{1}{2} \times 2$	$x 1\frac{1}{4}$	3	$x 2\frac{1}{2} \times 3$		$3\frac{1}{2} \times 3\frac{1}{2} \times 1$	4	$x 4$	$x 1$	$3\frac{1}{2} \times 3$	$x 4$			
$2\frac{1}{2} \times 2$	$x 1$	3	$x 2\frac{1}{2} \times 2\frac{1}{2}$		$3\frac{1}{2} \times 3\frac{1}{2} \times \frac{3}{4}$	4	$x 4$	$x \frac{3}{4}$	$3\frac{1}{2} \times 2\frac{1}{2} \times 4$				
$2\frac{1}{2} \times 2$	$x \frac{3}{4}$	3	$x 2\frac{1}{2} \times 2$		$3\frac{1}{2} \times 3\frac{1}{2} \times \frac{1}{2}$	4	$x 4$	$x \frac{1}{2}$	$3\frac{1}{2} \times 2$	$x 4$			
$2\frac{1}{2} \times 2$	$x \frac{1}{2}$	3	$x 2\frac{1}{2} \times 1\frac{1}{2}$		$3\frac{1}{2} \times 3$	$x 3\frac{1}{2}$	4	$x 3\frac{1}{2} \times 4$	3	$x 3$	$x 4$		
$2\frac{1}{2} \times 1\frac{1}{2} \times 2\frac{1}{2}$		3	$x 2\frac{1}{2} \times 1\frac{1}{4}$		$3\frac{1}{2} \times 3$	$x 3$	4	$x 3\frac{1}{2} \times 3\frac{1}{2}$	3	$x 2\frac{1}{2} \times 4$			
$2\frac{1}{2} \times 1\frac{1}{2} \times 2$		3	$x 2\frac{1}{2} \times 1$		$3\frac{1}{2} \times 3$	$x 2\frac{1}{2}$	4	$x 3\frac{1}{2} \times 3$	3	$x 2$	$x 4$		
$2\frac{1}{2} \times 1\frac{1}{2} \times 1\frac{1}{2}$		3	$x 2\frac{1}{2} \times \frac{3}{4}$		$3\frac{1}{2} \times 3$	$x 2$	4	$x 3\frac{1}{2} \times 2\frac{1}{2}$	$2\frac{1}{2} \times 2\frac{1}{2} \times 4$				
$2\frac{1}{2} \times 1\frac{1}{2} \times 1\frac{1}{4}$		3	$x 2\frac{1}{2} \times \frac{1}{2}$		$3\frac{1}{2} \times 3$	$x 1\frac{1}{2}$	4	$x 3\frac{1}{2} \times 2$	$2\frac{1}{2} \times 2$	$x 4$			
$2\frac{1}{2} \times 1\frac{1}{2} \times 1$		3	$x 2$	$x 3$	$3\frac{1}{2} \times 3$	$x 1\frac{1}{4}$	4	$x 3\frac{1}{2} \times 1\frac{1}{2}$	2	$x 2$	$x 4$		
$2\frac{1}{2} \times 1\frac{1}{2} \times \frac{3}{4}$		3	$x 2$	$x 2\frac{1}{2}$	$3\frac{1}{2} \times 3$	$x 1$	4	$x 3\frac{1}{2} \times 1\frac{1}{4}$	$4\frac{1}{2} \times 4\frac{1}{2} \times 4$				
$2\frac{1}{2} \times 1\frac{1}{4} \times 2\frac{1}{2}$		3	$x 2$	$x 2$	$3\frac{1}{2} \times 3$	$x \frac{3}{4}$	4	$x 3\frac{1}{2} \times 1$	$4\frac{1}{2} \times 4\frac{1}{2} \times 3\frac{1}{2}$				
$2\frac{1}{2} \times 1\frac{1}{4} \times 2$		3	$x 2$	$x 1\frac{1}{2}$	$3\frac{1}{2} \times 2\frac{1}{2} \times 3\frac{1}{2}$		4	$x 3$	$x 4$	$4\frac{1}{2} \times 4\frac{1}{2} \times 3$			
$2\frac{1}{2} \times 1\frac{1}{4} \times 1\frac{1}{2}$		3	$x 2$	$x 1\frac{1}{4}$	$3\frac{1}{2} \times 2\frac{1}{2} \times 3$		4	$x 3$	$x 3\frac{1}{2}$	$4\frac{1}{2} \times 4\frac{1}{2} \times 2\frac{1}{2}$			
$2\frac{1}{2} \times 1\frac{1}{4} \times 1\frac{1}{4}$		3	$x 2$	$x 1$	$3\frac{1}{2} \times 2\frac{1}{2} \times 2\frac{1}{2}$		4	$x 3$	$x 3$	$4\frac{1}{2} \times 4\frac{1}{2} \times 2$			
$2\frac{1}{2} \times 1\frac{1}{4} \times 1$		3	$x 2$	$x \frac{3}{4}$	$3\frac{1}{2} \times 2\frac{1}{2} \times 2$		4	$x 3$	$x 2\frac{1}{2}$	$4\frac{1}{2} \times 4\frac{1}{2} \times 1\frac{1}{2}$			
$2\frac{1}{2} \times 1$	$x 2\frac{1}{2}$	3	$x 1\frac{1}{2} \times 3$		$3\frac{1}{2} \times 2\frac{1}{2} \times 1\frac{1}{2}$		4	$x 3$	$x 2$	$4\frac{1}{2} \times 4\frac{1}{2} \times 1\frac{1}{4}$			
$2\frac{1}{2} \times 1$	$x 2$	3	$x 1\frac{1}{2} \times 2\frac{1}{2}$		$3\frac{1}{2} \times 2$	$x 3\frac{1}{2}$	4	$x 3$	$x 1\frac{1}{2}$	$4\frac{1}{2} \times 4\frac{1}{2} \times 1$			
$2\frac{1}{2} \times 1$	$x 1\frac{1}{2}$	3	$x 1\frac{1}{2} \times 2$		$3\frac{1}{2} \times 2$	$x 3$	4	$x 3$	$x 1\frac{1}{4}$	$4\frac{1}{2} \times 4$	$x 3$		
$2\frac{1}{2} \times 1$	$x 1$	3	$x 1\frac{1}{2} \times 1\frac{1}{2}$		$3\frac{1}{2} \times 2$	$x 2\frac{1}{2}$	4	$x 3$	$x 1$	$4\frac{1}{2} \times 4$	$x 2$		
$2\frac{1}{2} \times \frac{3}{4} \times 2\frac{1}{2}$		3	$x 1\frac{1}{2} \times 1\frac{1}{4}$		$3\frac{1}{2} \times 2$	$x 2$	4	$x 3$	$x \frac{3}{4}$	5	$x 5$	$x 4\frac{1}{2}$	
$2\frac{1}{2} \times \frac{3}{4} \times 2$		3	$x 1\frac{1}{4} \times 3$		$3\frac{1}{2} \times 1\frac{1}{2} \times 3\frac{1}{2}$		4	$x 2\frac{1}{2} \times 4$	5	$x 5$	$x 4$		
$2\frac{1}{2} \times \frac{3}{4} \times 1\frac{1}{2}$		3	$x 1\frac{1}{4} \times 2\frac{1}{2}$		$3\frac{1}{2} \times 1\frac{1}{2} \times 3$		4	$x 2\frac{1}{2} \times 3\frac{1}{2}$	5	$x 5$	$x 3\frac{1}{2}$		
$2\frac{1}{2} \times \frac{1}{2} \times 2\frac{1}{2}$		3	$x 1\frac{1}{4} \times 2$		$3\frac{1}{2} \times 1\frac{1}{2} \times 2\frac{1}{2}$		4	$x 2\frac{1}{2} \times 3$	5	$x 5$	$x 3$		
$2\frac{1}{2} \times \frac{1}{2} \times 2$		3	$x 1$	$x 3$	$3\frac{1}{2} \times 1\frac{1}{4} \times 3\frac{1}{2}$		4	$x 2\frac{1}{2} \times 2\frac{1}{2}$	5	$x 5$	$x 2\frac{1}{2}$		
2	$x 2$	$x 2\frac{1}{2}$	3	$x 1$	$x 2\frac{1}{2}$		4	$x 2\frac{1}{2} \times 2$	5	$x 5$	$x 2$		
2	$x 1\frac{1}{2} \times 2\frac{1}{2}$		3	$x \frac{3}{4} \times 3$			4	$x 2\frac{1}{2} \times 1\frac{1}{2}$	5	$x 5$	$x 1\frac{1}{2}$		
2	$x 1\frac{1}{4} \times 2\frac{1}{2}$		3	$x \frac{1}{2} \times 3$			4	$x 2\frac{1}{2} \times 1\frac{1}{4}$	5	$x 5$	$x 1\frac{1}{4}$		
2	$x 1$	$x 2\frac{1}{2}$	$2\frac{1}{2} \times 2\frac{1}{2} \times 3$		3	$x 3$	$x 3\frac{1}{2}$	4	$x 2\frac{1}{2} \times 1$	5	$x 5$	$x 1$	
2	$x \frac{3}{4} \times 2\frac{1}{2}$		$2\frac{1}{2} \times 2$	$x 3$	3	$x 2\frac{1}{2} \times 3\frac{1}{2}$		4	$x 2$	$x 4$	5	$x 5$	$x \frac{3}{4}$
$1\frac{1}{2} \times 1\frac{1}{2} \times 2\frac{1}{2}$			$2\frac{1}{2} \times 1\frac{1}{2} \times 3$		3	$x 2$	$x 3\frac{1}{2}$	4	$x 2$	$x 3\frac{1}{2}$	5	$x 4$	$x 5$
$1\frac{1}{2} \times 1\frac{1}{4} \times 2\frac{1}{2}$			$2\frac{1}{2} \times 1\frac{1}{4} \times 3$		3	$x 1\frac{1}{2} \times 3\frac{1}{2}$		4	$x 2$	$x 3$	5	$x 4$	$x 4\frac{1}{2}$
$1\frac{1}{2} \times 1$	$x 2\frac{1}{2}$		$2\frac{1}{2} \times 1$	$x 3$	$2\frac{1}{2} \times 2\frac{1}{2} \times 3\frac{1}{2}$		4	$x 2$	$x 2\frac{1}{2}$	5	$x 4$	$x 4$	
$1\frac{1}{4} \times 1\frac{1}{4} \times 2\frac{1}{2}$			2	$x 2$	$x 3$		4	$x 2$	$x 2$	5	$x 4$	$x 3\frac{1}{2}$	
3	$x 3$	$x 2\frac{1}{2}$	2	$x 1\frac{1}{2} \times 3$			4	$x 1\frac{1}{2} \times 4$	5	$x 4$	$x 3$		
3	$x 3$	$x 2$	$1\frac{1}{2} \times 1\frac{1}{2} \times 3$				4	$x 1\frac{1}{2} \times 3\frac{1}{2}$				
3	$x 3$	$x 1\frac{1}{2}$	$3\frac{1}{2} \times 3\frac{1}{2} \times 3$				4	$x 1\frac{1}{2} \times 3$				
3	$x 3$	$x 1\frac{1}{4}$	$3\frac{1}{2} \times 3\frac{1}{2} \times 2\frac{1}{2}$				4	$x 1\frac{1}{4} \times 4$				

LIST OF SIZES

Standard Cast Iron Fittings

TEES—REDUCING SIZES—Continued

5	x4	x2 $\frac{1}{2}$	6	x6	x4 $\frac{1}{2}$	6	x1 $\frac{1}{2}$ x6	8	x8	x1 $\frac{1}{2}$
5	x4	x2	6	x6	x4	6	x1 $\frac{1}{4}$ x6	8	x8	x1 $\frac{1}{4}$
5	x4	x1 $\frac{1}{2}$	6	x6	x3 $\frac{1}{2}$	6	x1 x6	8	x7	x8
5	x4	x1 $\frac{1}{4}$	6	x6	x3	5	x5 x6	8	x7	x6
5	x4	x1	6	x6	x2 $\frac{1}{2}$	5	x4 x6	8	x7	x5
5	x3 $\frac{1}{2}$ x5		6	x6	x2	5	x3 $\frac{1}{2}$ x6	8	x7	x4
5	x3 $\frac{1}{2}$ x4		6	x6	x1 $\frac{1}{2}$	5	x3 x6	8	x7	x3
5	x3 $\frac{1}{2}$ x3 $\frac{1}{2}$		6	x6	x1 $\frac{1}{4}$	4	x4 x6	8	x6	x8
5	x3 $\frac{1}{2}$ x3		6	x6	x1	4	x3 $\frac{1}{2}$ x6	8	x6	x7
5	x3 x5		6	x6	x $\frac{3}{4}$	7	x7 x6	8	x 6 x 6	
5	x3 x4 $\frac{1}{2}$		6	x5 x6		7	x7 x5	8	x 5 x 8	
5	x3 x4		6	x5 x5		7	x7 x4	8	x 5 x 5	
5	x3 x3 $\frac{1}{2}$		6	x5 x4		7	x7 x3 $\frac{1}{2}$	8	x 4 x 8	
5	x3 x3		6	x5 x3 $\frac{1}{2}$		7	x7 x3	8	x 4 x 6	
5	x3 x2 $\frac{1}{2}$		6	x5 x3		7	x7 x2 $\frac{1}{2}$	8	x 2 x 8	
5	x3 x2		6	x5 x2 $\frac{1}{2}$		7	x7 x2	6	x 6 x 8	
5	x2 $\frac{1}{2}$ x5		6	x5 x2		7	x6 x7	9	x 9 x 7	
5	x2 $\frac{1}{2}$ x4		6	x5 x1 $\frac{1}{2}$		7	x6 x6	9	x 9 x 6	
5	x2 $\frac{1}{2}$ x3		6	x5 x1 $\frac{1}{4}$		7	x6 x5	9	x 9 x 5	
5	x2 $\frac{1}{2}$ x2 $\frac{1}{2}$		6	x4 x6		7	x6 x4	10	x10 x 8	
5	x2 x5		6	x4 x5		7	x6 x3	10	x10 x 6	
5	x2 x4		6	x4 x4		7	x5 x6	10	x10 x 5	
5	x1 $\frac{1}{2}$ x5		6	x4 x3		7	x5 x5	10	x10 x 4	
5	x1 $\frac{1}{4}$ x5		6	x4 x2 $\frac{1}{2}$		7	x2 x7	10	x10 x 3	
5	x1 x5		6	x4 x2		6	x6 x7	10	x10 x 2	
4	x4 x5		6	x3 $\frac{1}{2}$ x6		5	x5 x7	10	x 8 x 8	
4	x3 $\frac{1}{2}$ x5		6	x3 $\frac{1}{2}$ x5		8	x8 x7	8	x 8 x10	
4	x3 x5		6	x3 $\frac{1}{2}$ x4		8	x8 x6	12	x12 x10	
4	x2 $\frac{1}{2}$ x5		6	x3 x6		8	x8 x5	12	x12 x 8	
4	x2 x5		6	x3 x5		8	x8 x4	12	x12 x 6	
3 $\frac{1}{2}$ x3 $\frac{1}{2}$ x5			6	x3 x4		8	x8 x3 $\frac{1}{2}$	12	x12 x 5	
3 $\frac{1}{2}$ x3 x5			6	x3 x3		8	x8 x3	12	x12 x 4	
3 x3 x5			6	x2 $\frac{1}{2}$ x6		8	x8 x2 $\frac{1}{2}$	12	x 8 x10	
6 x6 x5			6	x2 x6		8	x8 x2	12	x 8 x 8	

LIST OF SIZES

Standard Cast Iron Fittings

CROSSES—STRAIGHT SIZES

Straight Sizes.....	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Straight Sizes.....	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	6	7	8	9	10	12

CROSSES—REDUCING SIZES

Reducing Crosses are read thus:

$$\begin{array}{c} 1 \\ | \\ 2 - \text{---} 1\frac{1}{2} \\ | \\ 1 \end{array}$$

$2 \times 1\frac{1}{2} \times 1 \times 1$

$$\begin{array}{c} 1\frac{1}{2} \\ | \\ 2 - \text{---} 2 \\ | \\ 1\frac{1}{4} \end{array}$$

$2 \times 2 \times 1\frac{1}{2} \times 1\frac{1}{4}$

$$\begin{array}{c} 1\frac{1}{4} \\ | \\ 2 - \text{---} 2 \\ | \\ 1\frac{1}{4} \end{array}$$

$2 \times 2 \times 1\frac{1}{4} \times 1\frac{1}{4}$

$\frac{1}{2} \times \frac{1}{2} \times \frac{1}{2} \times \frac{1}{8}$	2	x2	x $\frac{3}{4} \times \frac{3}{4}$	$2\frac{1}{2} \times 2$	x $1\frac{1}{2} \times 1\frac{1}{2}$	3	x $2\frac{1}{2} \times 1\frac{1}{2} \times \frac{3}{4}$
$\frac{1}{2} \times \frac{1}{4} \times \frac{1}{2} \times \frac{1}{8}$	2	x2	x $\frac{1}{2} \times \frac{1}{2}$	$2\frac{1}{2} \times 2$	x $1\frac{1}{2} \times 1\frac{1}{4}$	3	x $2\frac{1}{2} \times 1\frac{1}{4} \times 1\frac{1}{4}$
$\frac{3}{4} \times \frac{3}{4} \times \frac{1}{2} \times \frac{1}{2}$	2	x $1\frac{1}{2} \times 1\frac{1}{2} \times 1\frac{1}{2}$		$2\frac{1}{2} \times 2$	x $1\frac{1}{2} \times 1$	3	x $2\frac{1}{2} \times 1\frac{1}{4} \times 1$
$\frac{3}{4} \times \frac{3}{4} \times \frac{1}{2} \times \frac{1}{4}$	2	x $1\frac{1}{2} \times 1\frac{1}{2} \times \frac{3}{4}$		$2\frac{1}{2} \times 2$	x $1\frac{1}{2} \times \frac{3}{4}$	3	x $2\frac{1}{2} \times 1\frac{1}{4} \times \frac{3}{4}$
$\frac{3}{4} \times \frac{1}{2} \times \frac{1}{2} \times \frac{1}{2}$	2	x $1\frac{1}{2} \times 1\frac{1}{4} \times 1\frac{1}{4}$		$2\frac{1}{2} \times 2$	x $1\frac{1}{4} \times 1\frac{1}{4}$	3	x $2\frac{1}{2} \times 1 \times 1$
1 x1 x $\frac{3}{4} \times \frac{3}{4}$	2	x $1\frac{1}{2} \times 1\frac{1}{4} \times 1$		$2\frac{1}{2} \times 2$	x $1\frac{1}{4} \times 1$	3	x2 x2 x2
1 x1 x $\frac{1}{2} \times \frac{1}{2}$	2	x $1\frac{1}{2} \times 1\frac{1}{4} \times \frac{3}{4}$		$2\frac{1}{2} \times 2$	x $1\frac{1}{4} \times \frac{3}{4}$	3	x2 x2 x $1\frac{1}{2}$
1 x $\frac{3}{4} \times \frac{3}{4} \times \frac{3}{4}$	2	x $1\frac{1}{2} \times 1 \times 1$		$2\frac{1}{2} \times 2$	x1 x1	$3\frac{1}{2} \times 3\frac{1}{2} \times 3$	x3
1 x $\frac{1}{2} \times \frac{3}{4} \times \frac{3}{4}$	2	x $1\frac{1}{2} \times 1 \times \frac{3}{4}$		$2\frac{1}{2} \times 2$	x1 x $\frac{3}{4}$	$3\frac{1}{2} \times 3\frac{1}{2} \times 2\frac{1}{2} \times 2\frac{1}{2}$	
$1\frac{1}{4} \times 1\frac{1}{4} \times 1 \times 1$	2	x $1\frac{1}{2} \times \frac{3}{4} \times \frac{3}{4}$		$2\frac{1}{2} \times 2$	x $\frac{3}{4} \times \frac{3}{4}$	$3\frac{1}{2} \times 3\frac{1}{2} \times 2 \times 2$	
$1\frac{1}{4} \times 1\frac{1}{4} \times \frac{3}{4} \times \frac{3}{4}$	2	x $1\frac{1}{2} \times 1 \times \frac{3}{4}$		$2\frac{1}{2} \times 1\frac{1}{2} \times 2$	x $1\frac{1}{2}$	$3\frac{1}{2} \times 3\frac{1}{2} \times 2 \times 1\frac{1}{2}$	
$1\frac{1}{4} \times 1\frac{1}{4} \times \frac{1}{2} \times \frac{1}{2}$	2	x $1\frac{1}{2} \times \frac{3}{4} \times \frac{3}{4}$		$2\frac{1}{2} \times 1\frac{1}{2} \times 1\frac{1}{2} \times 1$		$3\frac{1}{2} \times 3\frac{1}{2} \times 2 \times \frac{3}{4}$	
$1\frac{1}{4} \times 1 \times 1 \times 1$	2	x1 x2 x1		$2\frac{1}{2} \times 1\frac{1}{2} \times 1\frac{1}{4} \times 1\frac{1}{4}$		$3\frac{1}{2} \times 3\frac{1}{2} \times 1\frac{1}{2} \times 1\frac{1}{2}$	
$1\frac{1}{4} \times 1 \times \frac{3}{4} \times \frac{3}{4}$	2	x $\frac{3}{4} \times 2 \times \frac{1}{2}$		$2\frac{1}{2} \times 1\frac{1}{4} \times 2\frac{1}{2} \times \frac{1}{2}$		$3\frac{1}{2} \times 3\frac{1}{2} \times 1\frac{1}{2} \times 1\frac{1}{4}$	
$1\frac{1}{4} \times \frac{3}{4} \times \frac{3}{4} \times \frac{3}{4}$	2	x $\frac{1}{2} \times 1\frac{1}{2} \times 1\frac{1}{2}$		$2\frac{1}{2} \times \frac{1}{2} \times 2 \times 2$		$3\frac{1}{2} \times 3\frac{1}{2} \times 1\frac{1}{2} \times 1$	
$1\frac{1}{4} \times \frac{1}{2} \times 1 \times 1$	2	x $\frac{1}{2} \times 1\frac{1}{2} \times 1\frac{1}{4}$		$2\frac{1}{2} \times \frac{1}{2} \times 2 \times 1\frac{1}{2}$		$3\frac{1}{2} \times 3\frac{1}{2} \times 1\frac{1}{2} \times \frac{3}{4}$	
$1\frac{1}{4} \times \frac{1}{2} \times 1 \times \frac{3}{4}$	2	x $\frac{1}{2} \times 1\frac{1}{2} \times 1$		$2\frac{1}{2} \times \frac{1}{2} \times 1\frac{1}{2} \times 1\frac{1}{2}$		$3\frac{1}{2} \times 3\frac{1}{2} \times 1\frac{1}{4} \times 1\frac{1}{4}$	
$1\frac{1}{4} \times \frac{1}{2} \times \frac{3}{4} \times \frac{3}{4}$	2	x $\frac{1}{2} \times 1\frac{1}{2} \times \frac{3}{4}$		$2\frac{1}{2} \times \frac{1}{2} \times 1\frac{1}{2} \times 1\frac{1}{4}$		$3\frac{1}{2} \times 3\frac{1}{2} \times 1\frac{1}{4} \times 1$	
$1\frac{1}{2} \times 1\frac{1}{2} \times 1\frac{1}{4} \times 1\frac{1}{4}$	2	x $\frac{1}{2} \times 1\frac{1}{4} \times 1\frac{1}{4}$		3	x3 x2 $2\frac{1}{2} \times 2\frac{1}{2}$	$3\frac{1}{2} \times 3\frac{1}{2} \times 1\frac{1}{4} \times \frac{3}{4}$	
$1\frac{1}{2} \times 1\frac{1}{2} \times 1 \times 1$	2	x $\frac{1}{2} \times 1\frac{1}{4} \times 1$		3	x3 x2 x2	$3\frac{1}{2} \times 3\frac{1}{2} \times 1 \times 1$	
$1\frac{1}{2} \times 1\frac{1}{2} \times \frac{3}{4} \times \frac{3}{4}$	2	x $\frac{1}{2} \times 1\frac{1}{4} \times \frac{3}{4}$		3	x3 x2 x $1\frac{1}{2}$	$3\frac{1}{2} \times 3\frac{1}{2} \times 2\frac{1}{2} \times 2\frac{1}{2}$	
$1\frac{1}{2} \times 1\frac{1}{2} \times \frac{1}{2} \times \frac{1}{2}$	$2\frac{1}{2} \times 2\frac{1}{2} \times 2$	x2		3	x3 x2 x1	$3\frac{1}{2} \times 3\frac{1}{2} \times 2\frac{1}{2} \times 2$	
$1\frac{1}{2} \times 1\frac{1}{4} \times 1\frac{1}{2} \times \frac{1}{2}$	$2\frac{1}{2} \times 2\frac{1}{2} \times 2$	x $1\frac{1}{2}$		3	x3 x $1\frac{1}{2} \times 1\frac{1}{2}$	$3\frac{1}{2} \times 3\frac{1}{2} \times 2\frac{1}{2} \times 1\frac{1}{2}$	
$1\frac{1}{2} \times 1\frac{1}{4} \times 1\frac{1}{4} \times 1\frac{1}{4}$	$2\frac{1}{2} \times 2\frac{1}{2} \times 2$	x1		3	x3 x $1\frac{1}{2} \times 1\frac{1}{4}$	$3\frac{1}{2} \times 3\frac{1}{2} \times 2 \times 2$	
$1\frac{1}{2} \times 1\frac{1}{4} \times 1 \times 1$	$2\frac{1}{2} \times 2\frac{1}{2} \times 1\frac{1}{2} \times 1\frac{1}{2}$			3	x3 x $1\frac{1}{2} \times 1$	$3\frac{1}{2} \times 3\frac{1}{2} \times 2 \times 1\frac{1}{2}$	
$1\frac{1}{2} \times 1\frac{1}{4} \times \frac{3}{4} \times \frac{3}{4}$	$2\frac{1}{2} \times 2\frac{1}{2} \times 1\frac{1}{2} \times 1\frac{1}{4}$			3	x3 x $1\frac{1}{2} \times \frac{3}{4}$	$3\frac{1}{2} \times 3\frac{1}{2} \times 2 \times 1\frac{1}{4}$	
$1\frac{1}{2} \times 1 \times 1 \times \frac{3}{4}$	$2\frac{1}{2} \times 2\frac{1}{2} \times 1\frac{1}{2} \times 1$			3	x3 x $1\frac{1}{4} \times 1\frac{1}{4}$	$3\frac{1}{2} \times 3\frac{1}{2} \times 1\frac{1}{2} \times 1\frac{1}{2}$	
$1\frac{1}{2} \times 1 \times 1 \times \frac{1}{2}$	$2\frac{1}{2} \times 2\frac{1}{2} \times 1\frac{1}{2} \times \frac{3}{4}$			3	x3 x $1\frac{1}{4} \times 1$	$3\frac{1}{2} \times 3\frac{1}{2} \times 1\frac{1}{2} \times 1\frac{1}{4}$	
$1\frac{1}{2} \times 1 \times \frac{3}{4} \times \frac{3}{4}$	$2\frac{1}{2} \times 2\frac{1}{2} \times 1\frac{1}{4} \times 1\frac{1}{4}$			3	x3 x1 x1	$3\frac{1}{2} \times 3\frac{1}{2} \times 1\frac{1}{2} \times 1$	
$1\frac{1}{2} \times \frac{3}{4} \times 1 \times \frac{3}{4}$	$2\frac{1}{2} \times 2\frac{1}{2} \times 1\frac{1}{4} \times 1$			3	x3 x $\frac{3}{4} \times \frac{3}{4}$	$3\frac{1}{2} \times 3\frac{1}{2} \times 1\frac{1}{2} \times \frac{3}{4}$	
$1\frac{1}{2} \times \frac{1}{2} \times 1\frac{1}{4} \times 1\frac{1}{4}$	$2\frac{1}{2} \times 2\frac{1}{2} \times 1\frac{1}{4} \times \frac{3}{4}$			3	x $2\frac{1}{2} \times 2\frac{1}{2} \times 2$	$3\frac{1}{2} \times 3\frac{1}{2} \times 1\frac{1}{4} \times 1\frac{1}{4}$	
$1\frac{1}{2} \times \frac{1}{2} \times 1\frac{1}{4} \times 1$	$2\frac{1}{2} \times 2\frac{1}{2} \times 1 \times 1$			3	x $2\frac{1}{2} \times 2\frac{1}{2} \times 1\frac{1}{2}$	$3\frac{1}{2} \times 3\frac{1}{2} \times 1\frac{1}{4} \times 1$	
$1\frac{1}{2} \times \frac{1}{2} \times 1\frac{1}{4} \times \frac{3}{4}$	$2\frac{1}{2} \times 2\frac{1}{2} \times 1 \times \frac{3}{4}$			3	x $2\frac{1}{2} \times 2 \times 2$	4	x4 x $3\frac{1}{2} \times 3\frac{1}{2}$
$1\frac{1}{2} \times \frac{1}{2} \times 1 \times \frac{3}{4}$	$2\frac{1}{2} \times 2\frac{1}{2} \times \frac{3}{4} \times \frac{3}{4}$			3	x $2\frac{1}{2} \times 2 \times 1\frac{1}{2}$	4	x4 x3 x3
$1\frac{1}{2} \times \frac{1}{2} \times 1 \times \frac{1}{2}$	$2\frac{1}{2} \times 2\frac{1}{2} \times \frac{1}{2} \times \frac{1}{2}$			3	x $2\frac{1}{2} \times 2 \times 1\frac{1}{4}$	4	x4 x $2\frac{1}{2} \times 2\frac{1}{2}$
2	x2	x $1\frac{1}{2} \times 1\frac{1}{2}$		3	x $2\frac{1}{2} \times 2 \times 1$	4	x4 x2 x2
2	x2	x $1\frac{1}{4} \times 1\frac{1}{4}$		3	x $2\frac{1}{2} \times 2 \times \frac{3}{4}$	4	x4 x $2 \times 1\frac{1}{2}$
2	x2	x $1\frac{1}{4} \times 1$		3	x $2\frac{1}{2} \times 1\frac{1}{2} \times 1\frac{1}{2}$	.....
2	x2	x1 x1		3	x $2\frac{1}{2} \times 1\frac{1}{2} \times 1\frac{1}{4}$	.....
2	x2	x $\frac{3}{4}$		3	x $2\frac{1}{2} \times 1\frac{1}{2} \times 1$	.....

LIST OF SIZES

Standard Cast Iron Fittings

CROSSES—REDUCING SIZES—Continued

4	x4	x2	x1	4	x3 ¹ / ₂ x1 ¹ / ₂ x1	5	x4	x2	x2	6	x	5x	2	x	1 ¹ / ₂				
4	x4	x1 ¹ / ₂ x1 ¹ / ₂		4	x3 ¹ / ₂ x1 ¹ / ₄ x1 ¹ / ₄	5	x4	x2	x1 ¹ / ₂	6	x	5x	1 ¹ / ₂ x		1 ¹ / ₂				
4	x4	x1 ¹ / ₂ x1 ¹ / ₄		4	x3 ¹ / ₂ x1 ¹ / ₄ x1	5	x4	x1 ¹ / ₂ x1 ¹ / ₂		7	x	7x	6	x	6				
4	x4	x1 ¹ / ₂ x1		4	x3	x2 ¹ / ₂ x2	5	x4	x1 ¹ / ₂ x1 ¹ / ₄	7	x	7x	5	x	5				
4	x4	x1 ¹ / ₂ x ³ / ₄		5	x5	x4	x4	5	x4	x1 ¹ / ₄ x1	7	x	7x	4	x	4			
4	x4	x1 ¹ / ₄ x1 ¹ / ₄		5	x5	x3 ¹ / ₂ x3 ¹ / ₂	5	x4	x1	x1	8	x	8x	7	x	7			
4	x4	x1 ¹ / ₄ x1		5	x5	x3	x3	6	x6	x5	x5	8	x	8x	6	x	6		
4	x4	x1 ¹ / ₄ x ³ / ₄		5	x5	x2 ¹ / ₂ x2 ¹ / ₂	5	x5	x2 ¹ / ₂ x2 ¹ / ₂	6	x6	x4	x4	8	x	8x	5	x	5
4	x4	x1	x1	5	x5	x2	x2	6	x6	x3 ¹ / ₂ x3 ¹ / ₂	8	x	8x	4	x	4			
4	x3 ¹ / ₂ x2 ¹ / ₂ x2 ¹ / ₂			5	x5	x2	x1 ¹ / ₂	6	x6	x3	x3	10	x10x	8	x	8			
4	x3 ¹ / ₂ x2 ¹ / ₂ x2			5	x5	x1 ¹ / ₂ x1 ¹ / ₂	6	x6	x2 ¹ / ₂ x2 ¹ / ₂	10	x10x	7	x	7					
4	x3 ¹ / ₂ x2 ¹ / ₂ x1			5	x5	x1 ¹ / ₂ x1 ¹ / ₄	6	x6	x2	x2	10	x10x	6	x	6				
4	x3 ¹ / ₂ x2	x2		5	x5	x1 ¹ / ₂ x ³ / ₄	6	x6	x2	x1 ¹ / ₂	12	x12x10		x10					
4	x3 ¹ / ₂ x2	x1 ¹ / ₂		5	x5	x1 ¹ / ₄ x1 ¹ / ₄	6	x6	x1 ¹ / ₂ x1 ¹ / ₂	12	x12x	8	x	8					
4	x3 ¹ / ₂ x2	x1 ¹ / ₄		5	x5	x1 ¹ / ₄ x ³ / ₄	6	x6	x1 ¹ / ₂ x ³ / ₄	.....								
4	x3 ¹ / ₂ x2	x1		5	x5	x1	x1	6	x6	x1 ¹ / ₄ x1 ¹ / ₄	.....							
4	x3 ¹ / ₂ x1 ¹ / ₂ x1 ¹ / ₂			5	x4	x2 ¹ / ₂ x2 ¹ / ₂	6	x5	x3	x3	.....							
4	x3 ¹ / ₂ x1 ¹ / ₂ x1 ¹ / ₄			5	x4	x2 ¹ / ₂ x2	6	x5	x2	x2	.....							

REDUCERS

$\frac{3}{4} \times \frac{1}{2}$	3 $\times 1\frac{1}{4}$	$4\frac{1}{2} \times 4$	6 $\times 3$
1 $\times \frac{1}{2}$	3 $\times 1$	5 $\times 4\frac{1}{2}$	6 $\times 2\frac{1}{2}$
$2\frac{1}{2} \times 2$	$3\frac{1}{2} \times 3$	5 $\times 4$	6 $\times 2$
$2\frac{1}{2} \times 1\frac{1}{2}$	$3\frac{1}{2} \times 2\frac{1}{2}$	5 $\times 3\frac{1}{2}$	8 $\times 7$
$2\frac{1}{2} \times 1\frac{1}{4}$	$3\frac{1}{2} \times 2$	5 $\times 3$	8 $\times 6$
$2\frac{1}{2} \times 1$	4 $\times 3\frac{1}{2}$	5 $\times 2\frac{1}{2}$	8 $\times 4$
$2\frac{1}{2} \times \frac{3}{4}$	4 $\times 3$	5 $\times 2$	10 $\times 8$
3 $\times 2\frac{1}{2}$	4 $\times 2\frac{1}{2}$	6 $\times 5$	10 $\times 6$
3 $\times 2$	4 $\times 2$	6 $\times 4$	12 $\times 10$
3 $\times 1\frac{1}{2}$	4 $\times 1\frac{1}{2}$	6 $\times 3\frac{1}{2}$	12 $\times 8$

ECCENTRIC REDUCERS

1 ¹ / ₄ x1	2 ¹ / ₂ x1 ¹ / ₄	4 x3	5 x2
1 ¹ / ₄ x ¾	3 x2 ¹ / ₂	4 x2 ¹ / ₂	6 x5
1 ¹ / ₂ x1 ¹ / ₄	3 x2	4 x2	6 x4
1 ¹ / ₂ x1	3 x1 ¹ / ₂	4 x1 ¹ / ₂	6 x3 ¹ / ₂
2 x1 ¹ / ₂	3 ¹ / ₂ x3	4 ¹ / ₂ x4	6 x3
2 x1 ¹ / ₄	3 ¹ / ₂ x2 ¹ / ₂	5 x4 ¹ / ₂	6 x2 ¹ / ₂
2 x1	3 ¹ / ₂ x2	5 x4	7 x6
2 x ¾	3 ¹ / ₂ x1 ¹ / ₂	5 x3 ¹ / ₂	8 x7
2 ¹ / ₂ x2	3 ¹ / ₂ x1 ¹ / ₄	5 x3	8 x6
2 ¹ / ₂ x1 ¹ / ₂	4 x3 ¹ / ₂	5 x2 ¹ / ₂	8 x5

LIST OF SIZES
Standard Cast Iron Fittings

CAPS

Size.....	Inches	2½	3	3½	4	4½	5
Size.....	Inches	6	7	8	9	10	12

SQUARE HEAD PLUGS

Size.....	Inches	⅛	¼	⅜	½	¾	1	1¼	1½	2	2½	3
Size.....	Inches	3½	4	4½	5	6	7	8	9	10	12	..

SQUARE HEAD SOLID PLUGS

Size.....	Inches	¼	⅜	½	¾	1	1¼	1½	2	2½	3
Size.....	Inches	3½	4	4½	5	6	7	8	9	10	12

SLOTTED OR BAR TYPE PLUGS

Size.....	Inches	4	4½	5	6	7	8	9	10	12
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COUNTERSUNK PLUGS

Size.....	Inches	½	¾	1	1¼	1½	2	2½	3	3½	4
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LOCKNUTS

Size.....	Inches	2½	3	3½	4
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Sizes 2" and smaller, see Malleable Iron.

Y'S OR LATERALS—STRAIGHT SIZES

Size.....	Inches	½	¾	1	1¼	1½	2	2½	3	3½
Size.....	Inches	4	4½	5	6	8

Reducing sizes to order.

Y'S—FLANGE AND SCREW

Size.....	Inches	4	5	6	8
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C. I. COUPLINGS

Size.....	Inches	1¼	1½	2	2½	3	3½	4	5	6
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RETURN BENDS—CLOSE PATTERN

Size.....	Inches	½	¾	1	1¼	1½	2	2½	3
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RETURN BENDS—OPEN PATTERN

Size.....	Inches	½	¾	1	1¼	1½	2	2½	3
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RETURN BENDS—SPECIAL WIDE PATTERN

Size.....	Inches	1 x 4	1 x 5	1¼x4½	1¼x6	1½x6
Size.....	Inches	1½x7½	2 x 6	2½x8

LIST OF SIZES
Standard Cast Iron Fittings
FACE BUSHINGS

† 1/4 x 1/8	1 1/4 x 3/4	† 2 1/2 x 1 1/2	4 x 1 1/2	6 x 2 1/2
† 3/8 x 1/8	† 1 1/4 x 1	† 2 1/2 x 2	4 x 2	6 x 3
† 3/8 x 1/4	1 1/2 x 1/2	3 x 1	4 x 2 1/2	6 x 3 1/2
† 1/2 x 1/4	1 1/2 x 3/4	3 x 1 1/4	4 x 3	6 x 4
† 1/2 x 3/8	1 1/2 x 1	3 x 1 1/2	† 4 x 3 1/2	6 x 4 1/2
† 3/4 x 1/4	† 1 1/2 x 1 1/4	3 x 2	4 1/2 x 4	† 6 x 5
† 3/4 x 3/8	2 x 1/2	† 3 x 2 1/2	5 x 2	7 x 4
† 3/4 x 1/2	2 x 3/4	3 1/2 x 1 1/4	5 x 2 1/2	7 x 5
† 1 x 1/4	2 x 1	3 1/2 x 1 1/2	5 x 3	7 x 6
† 1 x 3/8	2 x 1 1/4	3 1/2 x 2	5 x 3 1/2	8 x 4
† 1 x 1/2	† 2 x 1 1/2	3 1/2 x 2 1/2	5 x 4	8 x 5
† 1 x 3/4	2 1/2 x 1	† 3 1/2 x 3	5 x 4 1/2	8 x 6
1 1/4 x 1/2	2 1/2 x 1 1/4	4 x 1 1/4	6 x 2	8 x 7

HEX BUSHINGS

1/4 x 1/8	1 1/2 x 3/8	3 x 1	4 1/2 x 3 1/2	8 x 2
3/8 x 1/8	1 1/2 x 1/2	3 x 1 1/4	4 1/2 x 4	8 x 2 1/2
3/8 x 1/4	1 1/2 x 3/4	3 x 1 1/2	5 x 1 1/4	8 x 3
1/2 x 1/8	1 1/2 x 1	3 x 2	5 x 1 1/2	8 x 3 1/2
1/2 x 1/4	1 1/2 x 1 1/4	3 x 2 1/2	5 x 2	8 x 4
1/2 x 3/8	2 x 1/4	3 1/2 x 3/4	5 x 2 1/2	8 x 5
3/4 x 1/8	2 x 3/8	3 1/2 x 1	5 x 3	8 x 6
3/4 x 1/4	2 x 1/2	3 1/2 x 1 1/4	5 x 3 1/2	8 x 7
3/4 x 3/8	2 x 3/4	3 1/2 x 1 1/2	5 x 4	10 x 4
3/4 x 1/2	2 x 1	3 1/2 x 2	5 x 4 1/2	10 x 6
1 x 1/4	2 x 1 1/4	3 1/2 x 2 1/2	6 x 2	10 x 8
1 x 3/8	2 x 1 1/2	3 1/2 x 3	6 x 2 1/2	12 x 6
1 x 1/2	2 1/2 x 1/2	4 x 1	6 x 3	12 x 8
1 x 3/4	2 1/2 x 3/4	4 x 1 1/4	6 x 3 1/2	12 x 10
1 1/4 x 1/4	2 1/2 x 1	4 x 1 1/2	6 x 4	.....
1 1/4 x 3/8	2 1/2 x 1 1/4	4 x 2	6 x 5	.....
1 1/4 x 1/2	2 1/2 x 1 1/2	4 x 2 1/2	7 x 3	.....
1 1/4 x 3/4	2 1/2 x 2	4 x 3	7 x 4	.....
1 1/4 x 1	3 x 1/2	4 x 3 1/2	7 x 5	.....
1 1/2 x 1/4	3 x 3/4	4 1/2 x 3	7 x 6	.....

ECCENTRIC BUSHINGS

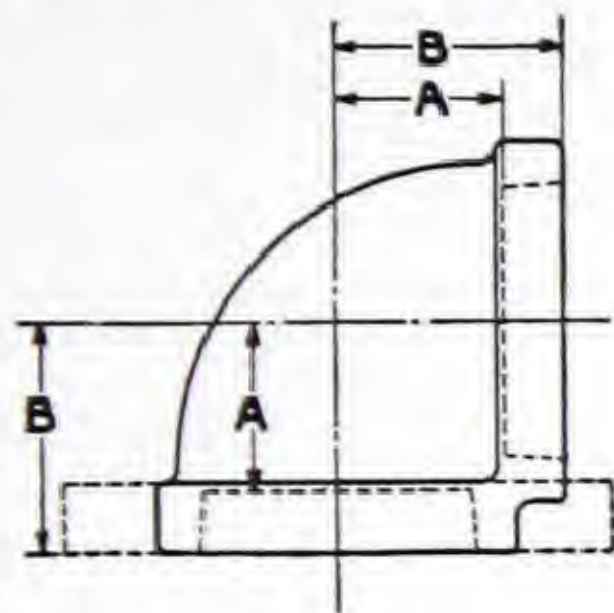
1 1/4 x 1/2	2 x 3/4	2 1/2 x 1 1/2	3 x 2	4 x 2 1/2
1 1/4 x 3/4	2 x 1	3 x 3/4	4 x 1	4 x 3
1 1/2 x 1/2	2 x 1 1/4	3 x 1	4 x 1 1/4	5 x 2
1 1/2 x 3/4	2 1/2 x 1	3 x 1 1/4	4 x 1 1/2	5 x 4
2 x 1/2	2 1/2 x 1 1/4	3 x 1 1/2	4 x 2	6 x 4

† Indicates Face Bushings Stocked Malleable.

We also keep in stock Galvanized Bushings in sizes 1/2 to 6 inch inclusive.
Other sizes made to order.

DIMENSIONS Cast Iron Elbows

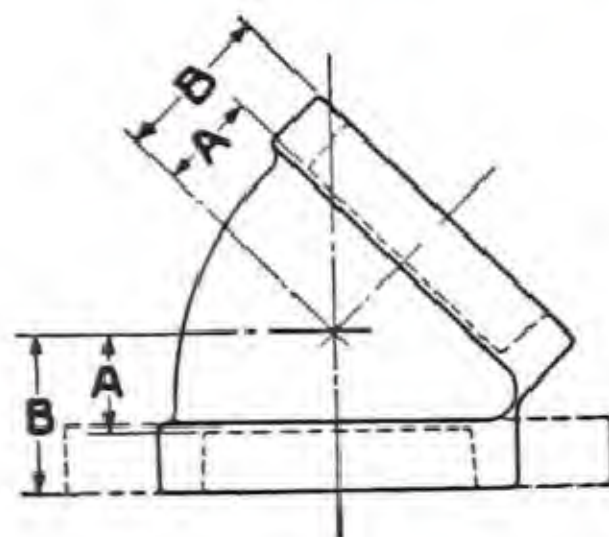
125 Lbs. Steam Pressure



Elbow

Fig. Nos. 351, 353, 354, 371

175 Lbs. Water Pressure



Angle Elbow

Fig. Nos. 356, 372

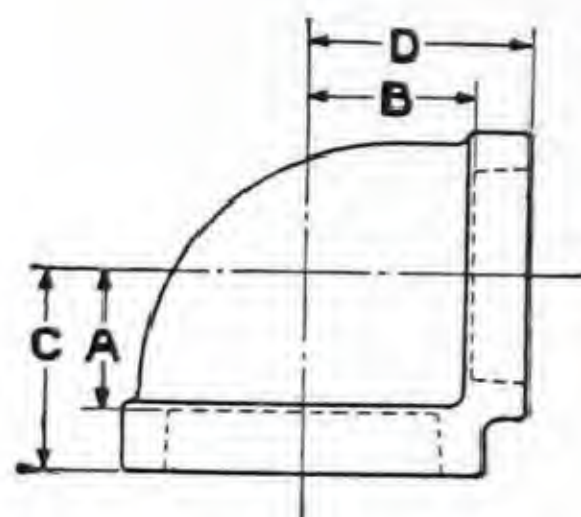
Dimension A = End of Pipe
Dimension B is same for Screw or Flange Ends

C. I. ELBOWS			C. I. ANGLE ELBOWS		
SIZE	DIMENSIONS		SIZE	DIMENSIONS	
	A	B		A	B
1/4	1/2	13/16	1/4	7/16	3/4
3/8	5/8	1	3/8	7/16	13/16
1/2	11/16	1 1/8	1/2	7/16	7/8
3/4	13/16	1 5/16	3/4	1 1/2	1
1	15/16	1 1/2	1	9/16	1 1/8
1 1/4	1 1/8	1 3/4	1 1/4	11/16	1 5/16
1 1/2	1 5/16	1 15/16	1 1/2	13/16	1 7/16
2	1 9/16	2 1/4	2	1	1 11/16
2 1/2	1 13/16	2 11/16	2 1/2	1 1/16	1 15/16
3	2 3/16	3 1/8	3	1 3/16	2 3/16
3 1/2	2 7/16	3 7/16	3 1/2	1 3/8	2 3/8
4	2 11/16	3 3/4	4	1 9/16	2 5/8
4 1/2	3	4 1/8	4 1/2	1 11/16	2 13/16
5	3 5/16	4 1/2	5	1 7/8	3 1/16
6	3 7/8	5 1/8	6	2 3/16	3 7/16
7	4 1/2	5 13/16	7	2 3/8	3 11/16
8	5 3/16	6 9/16	8	2 11/16	4 1/16
9	5 13/16	7 1/4	9	3	4 7/16
10	6 9/16	8 1/16	10	3 3/8	4 7/8
12	7 3/4	9 1/2	12	3 7/8	5 5/8
14	8 7/16	10 3/8	...	...	...
16	9 5/8	11 13/16	...	...	...

DIMENSIONS Cast Iron Elbows

125 Lbs. Steam Pressure

175 Lbs. Water Pressure



Reducing Elbow
Fig. No. 352

Dimensions A and B = End of Pipe
Dimensions C and D = Face of Fitting

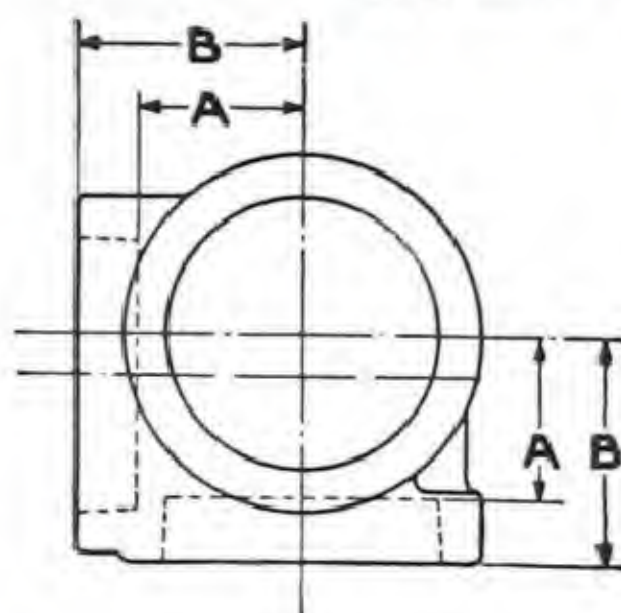
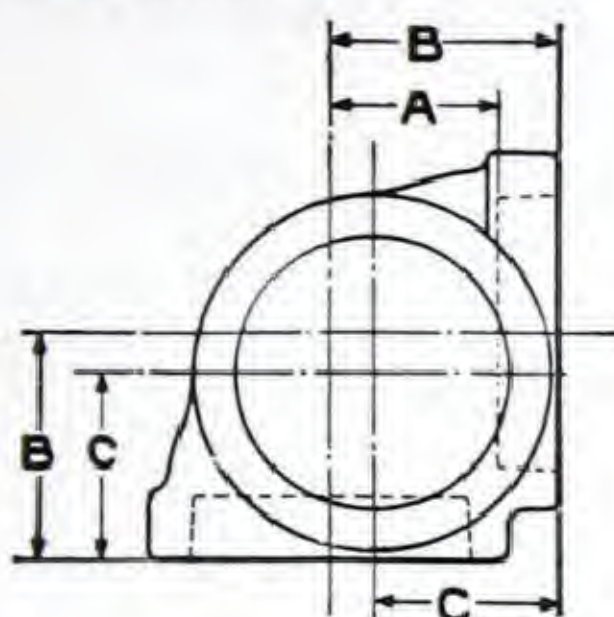
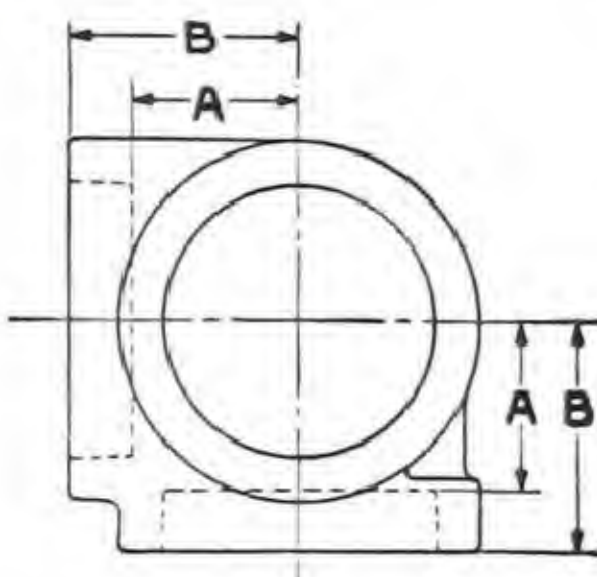
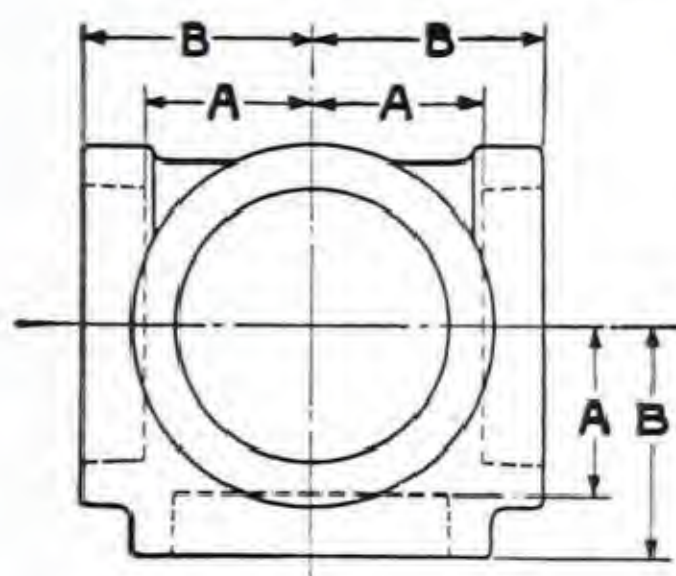
C. I. REDUCING ELBOWS					C. I. REDUCING ELBOWS				
SIZE	DIMENSIONS				SIZE	DIMENSIONS			
	A	B	C	D		A	B	C	D
$\frac{3}{8} \times \frac{1}{4}$	$\frac{5}{8}$	$\frac{11}{16}$	1	1	3 x 2	$1\frac{5}{8}$	$2\frac{1}{4}$	$2\frac{9}{16}$	$2\frac{15}{16}$
$\frac{1}{2} \times \frac{3}{8}$	$\frac{11}{16}$	$\frac{3}{4}$	$1\frac{1}{8}$	$1\frac{1}{8}$	3 x $1\frac{1}{2}$	$1\frac{5}{8}$	$2\frac{5}{16}$	$2\frac{9}{16}$	$2\frac{15}{16}$
$\frac{1}{2} \times \frac{1}{4}$	$\frac{11}{16}$	$\frac{13}{16}$	$1\frac{1}{8}$	$1\frac{1}{8}$	3 x $1\frac{1}{4}$	$1\frac{5}{8}$	$2\frac{5}{16}$	$2\frac{9}{16}$	$2\frac{15}{16}$
$\frac{3}{4} \times \frac{1}{2}$	$\frac{11}{16}$	$\frac{13}{16}$	$1\frac{3}{16}$	$1\frac{1}{4}$	3 x 1	$1\frac{5}{8}$	$2\frac{3}{8}$	$2\frac{9}{16}$	$2\frac{15}{16}$
$\frac{3}{4} \times \frac{3}{8}$	$\frac{11}{16}$	$\frac{15}{16}$	$1\frac{3}{16}$	$1\frac{1}{4}$	$3\frac{1}{2} \times 3$	$2\frac{3}{16}$	$2\frac{7}{16}$	$3\frac{3}{16}$	$3\frac{3}{8}$
$\frac{3}{4} \times \frac{1}{4}$	$\frac{11}{16}$	1	$1\frac{3}{16}$	$1\frac{1}{4}$	$3\frac{1}{2} \times 2\frac{1}{2}$	$1\frac{7}{8}$	$2\frac{7}{16}$	$2\frac{7}{8}$	$3\frac{5}{16}$
1 x $\frac{3}{4}$	$\frac{13}{16}$	$\frac{15}{16}$	$1\frac{3}{8}$	$1\frac{7}{16}$	$3\frac{1}{2} \times 2$	$1\frac{7}{8}$	$2\frac{5}{8}$	$2\frac{7}{8}$	$3\frac{5}{16}$
1 x $\frac{1}{2}$	$\frac{11}{16}$	$\frac{15}{16}$	$1\frac{1}{4}$	$1\frac{3}{8}$	$3\frac{1}{2} \times 1\frac{1}{2}$	$1\frac{7}{8}$	$2\frac{11}{16}$	$2\frac{7}{8}$	$3\frac{5}{16}$
1 x $\frac{3}{8}$	$\frac{11}{16}$	$1\frac{1}{16}$	$1\frac{1}{4}$	$1\frac{3}{8}$	$3\frac{1}{2} \times 1\frac{1}{4}$	$1\frac{7}{8}$	$2\frac{11}{16}$	$2\frac{7}{8}$	$3\frac{5}{16}$
$1\frac{1}{4} \times 1$	$\frac{15}{16}$	$1\frac{1}{8}$	$1\frac{9}{16}$	$1\frac{11}{16}$	4 x $3\frac{1}{2}$	$2\frac{7}{16}$	$2\frac{11}{16}$	$3\frac{1}{2}$	$3\frac{11}{16}$
$1\frac{1}{4} \times \frac{3}{4}$	$\frac{13}{16}$	$1\frac{1}{8}$	$1\frac{7}{16}$	$1\frac{5}{8}$	4 x 3	$2\frac{3}{16}$	$2\frac{11}{16}$	$3\frac{1}{4}$	$3\frac{5}{8}$
$1\frac{1}{4} \times \frac{1}{2}$	$\frac{13}{16}$	$1\frac{3}{16}$	$1\frac{7}{16}$	$1\frac{5}{8}$	4 x $2\frac{1}{2}$	$2\frac{3}{16}$	$2\frac{3}{4}$	$3\frac{1}{4}$	$3\frac{5}{8}$
$1\frac{1}{4} \times \frac{3}{8}$	$\frac{13}{16}$	$1\frac{1}{4}$	$1\frac{7}{16}$	$1\frac{5}{8}$	4 x 2	$2\frac{3}{16}$	$2\frac{15}{16}$	$3\frac{1}{4}$	$3\frac{5}{8}$
$1\frac{1}{2} \times 1\frac{1}{4}$	$1\frac{3}{16}$	$1\frac{1}{4}$	$1\frac{13}{16}$	$1\frac{7}{8}$	4 x $1\frac{1}{2}$	$2\frac{3}{16}$	3	$3\frac{1}{4}$	$3\frac{5}{8}$
$1\frac{1}{2} \times 1$	1	$1\frac{1}{4}$	$1\frac{5}{8}$	$1\frac{13}{16}$	$4\frac{1}{2} \times 4$	3	$3\frac{1}{16}$	$4\frac{1}{8}$	$4\frac{1}{8}$
$1\frac{1}{2} \times \frac{3}{4}$	1	$1\frac{5}{16}$	$1\frac{5}{8}$	$1\frac{13}{16}$	5 x $4\frac{1}{2}$	$3\frac{5}{16}$	$3\frac{3}{8}$	$4\frac{1}{2}$	$4\frac{1}{2}$
$1\frac{1}{2} \times \frac{1}{2}$	1	$1\frac{3}{8}$	$1\frac{5}{8}$	$1\frac{13}{16}$	5 x 4	$2\frac{13}{16}$	$3\frac{5}{16}$	4	$4\frac{3}{8}$
2 x $1\frac{1}{2}$	$1\frac{5}{16}$	$1\frac{1}{2}$	2	$2\frac{1}{8}$	5 x $3\frac{1}{2}$	$2\frac{13}{16}$	$3\frac{3}{8}$	4	$4\frac{3}{8}$
2 x $1\frac{1}{4}$	$1\frac{3}{16}$	$1\frac{7}{16}$	$1\frac{7}{8}$	$2\frac{1}{16}$	5 x 3	$2\frac{13}{16}$	$3\frac{7}{16}$	4	$4\frac{3}{8}$
2 x 1	$1\frac{3}{16}$	$1\frac{1}{2}$	$1\frac{7}{8}$	$2\frac{1}{16}$	5 x $2\frac{1}{2}$	$2\frac{13}{16}$	$3\frac{1}{2}$	4	$4\frac{3}{8}$
2 x $\frac{3}{4}$	$1\frac{3}{16}$	$1\frac{9}{16}$	$1\frac{7}{8}$	$2\frac{1}{16}$	6 x 5	$3\frac{3}{8}$	$3\frac{13}{16}$	$4\frac{5}{8}$	5
2 x $\frac{1}{2}$	$1\frac{3}{16}$	$1\frac{5}{8}$	$1\frac{7}{8}$	$2\frac{1}{16}$	6 x 4	$3\frac{3}{8}$	$3\frac{15}{16}$	$4\frac{5}{8}$	5
$2\frac{1}{2} \times 2$	$1\frac{9}{16}$	$1\frac{7}{8}$	$2\frac{7}{16}$	$2\frac{9}{16}$	6 x $3\frac{1}{2}$	$3\frac{3}{8}$	4	$4\frac{5}{8}$	5
$2\frac{1}{2} \times 1\frac{1}{2}$	$1\frac{3}{16}$	$1\frac{13}{16}$	$2\frac{3}{16}$	$2\frac{7}{16}$	6 x 3	$3\frac{3}{8}$	$4\frac{1}{16}$	$4\frac{5}{8}$	5
$2\frac{1}{2} \times 1\frac{1}{4}$	$1\frac{5}{16}$	$1\frac{13}{16}$	$2\frac{8}{16}$	$2\frac{7}{16}$	7 x 6	$4\frac{1}{2}$	$4\frac{9}{16}$	$5\frac{13}{16}$	$5\frac{13}{16}$
$2\frac{1}{2} \times 1$	$1\frac{5}{16}$	$1\frac{7}{8}$	$2\frac{8}{16}$	$2\frac{7}{16}$	8 x 7	$5\frac{3}{16}$	$5\frac{1}{4}$	$6\frac{9}{16}$	$6\frac{9}{16}$
$2\frac{1}{2} \times \frac{3}{4}$	$1\frac{5}{16}$	$1\frac{15}{16}$	$2\frac{8}{16}$	$2\frac{7}{16}$	8 x 6	$5\frac{3}{16}$	$5\frac{5}{16}$	$6\frac{9}{16}$	$6\frac{9}{16}$
3 x $2\frac{1}{2}$	$1\frac{7}{8}$	$2\frac{3}{16}$	$2\frac{13}{16}$	$3\frac{1}{16}$	10 x 8	$6\frac{9}{16}$	$6\frac{11}{16}$	$8\frac{1}{16}$	$8\frac{1}{16}$

DIMENSIONS

Cast Iron Side Outlet Elbows and Tees

125 Lbs. Steam Pressure

175 Lbs. Water Pressure

Side Outlet Elbow
Fig. No. 363Side Outlet Tee
Fig. No. 364

Dimension A = End of Pipe
Dimensions B and C = Face of Fitting

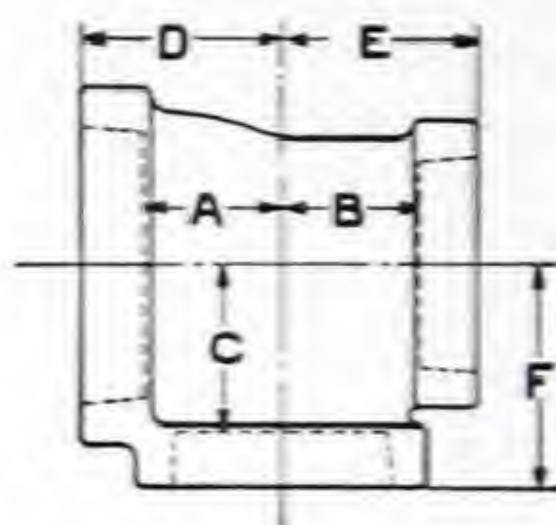
SIDE OUTLET ELBOW				SIDE OUTLET TEE		
SIZE	DIMENSIONS			SIZE	DIMENSIONS	
	A	B	C		A	B
1/2	11/16	1 1/8	15/16	1/2	11/16	1 1/8
3/4	13/16	1 5/16	1 1/16	3/4	13/16	1 5/16
1	15/16	1 1/2	1 1/4	1	15/16	1 1/2
1 1/4	1 1/8	1 3/4	1 7/16	1 1/4	1 1/8	1 3/4
1 1/2	1 5/16	1 15/16	1 5/8	1 1/2	1 5/16	1 15/16
2	1 9/16	2 1/4	1 7/8	2	1 9/16	2 1/4
2 1/2	1 13/16	2 11/16	2 1/4	2 1/2	1 13/16	2 11/16
3	2 3/16	3 1/8	2 9/16	3	2 3/16	3 1/8
4	2 11/16	3 3/4	3 1/16	4	2 11/16	3 3/4
5	3 5/16	4 1/2	3 5/8	5	3 5/16	4 1/2
6	3 7/8	5 1/8	4 1/8	6	3 7/8	5 1/8

Dimensions for reducing sizes furnished on application.

DIMENSIONS Cast Iron Tees

125 Lbs. Steam Pressure

175 Lbs. Water Pressure



Tees—Fig. Nos. 358, 359

Dimensions A, B and C = End of Pipe
Dimensions D, E and F = Face of Fittings

SIZE			DIMENSIONS					
			A	B	C	D	E	F
$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{13}{16}$	$\frac{13}{16}$	$\frac{13}{16}$
$\frac{3}{8}$	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{5}{8}$	$\frac{5}{8}$	$\frac{5}{8}$	1	1	1
$\frac{3}{8}$	$\frac{3}{8}$	$\frac{1}{4}$	$\frac{5}{8}$	$\frac{5}{8}$	$\frac{11}{16}$	1	1	1
$\frac{3}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{5}{8}$	$\frac{11}{16}$	$\frac{5}{8}$	1	1	1
$\frac{3}{8}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{5}{8}$	$\frac{11}{16}$	$\frac{11}{16}$	1	1	1
$\frac{1}{4}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{11}{16}$	$\frac{11}{16}$	$\frac{5}{8}$	1	1	1
$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{11}{16}$	$\frac{11}{16}$	$\frac{11}{16}$	$1\frac{1}{8}$	$1\frac{1}{8}$	$1\frac{1}{8}$
$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{8}$	$\frac{11}{16}$	$\frac{11}{16}$	$\frac{3}{4}$	$1\frac{1}{8}$	$1\frac{1}{8}$	$1\frac{1}{8}$
$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{4}$	$\frac{11}{16}$	$\frac{11}{16}$	$\frac{13}{16}$	$1\frac{1}{8}$	$1\frac{1}{8}$	$1\frac{1}{8}$
$\frac{1}{2}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{11}{16}$	$\frac{3}{4}$	$\frac{11}{16}$	$1\frac{1}{8}$	$1\frac{1}{8}$	$1\frac{1}{8}$
$\frac{1}{2}$	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{11}{16}$	$\frac{3}{4}$	$\frac{3}{4}$	$1\frac{1}{8}$	$1\frac{1}{8}$	$1\frac{1}{8}$
$\frac{1}{2}$	$\frac{1}{4}$	$\frac{1}{2}$	$\frac{11}{16}$	$\frac{13}{16}$	$\frac{11}{16}$	$1\frac{1}{8}$	$1\frac{1}{8}$	$1\frac{1}{8}$
$\frac{1}{2}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{11}{16}$	$\frac{13}{16}$	$\frac{13}{16}$	$1\frac{1}{8}$	$1\frac{1}{8}$	$1\frac{1}{8}$
$\frac{3}{8}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{11}{16}$	$1\frac{1}{8}$	$1\frac{1}{8}$	$1\frac{1}{8}$
$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{2}$	$\frac{13}{16}$	$\frac{13}{16}$	$\frac{11}{16}$	$1\frac{1}{8}$	$1\frac{1}{8}$	$1\frac{1}{8}$
$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{13}{16}$	$\frac{13}{16}$	$\frac{13}{16}$	$1\frac{5}{16}$	$1\frac{5}{16}$	$1\frac{5}{16}$
$\frac{3}{4}$	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{11}{16}$	$\frac{11}{16}$	$\frac{13}{16}$	$1\frac{3}{16}$	$1\frac{3}{16}$	$1\frac{1}{4}$
$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{8}$	$\frac{11}{16}$	$\frac{11}{16}$	$\frac{15}{16}$	$1\frac{3}{16}$	$1\frac{3}{16}$	$1\frac{1}{4}$
$\frac{3}{4}$	$\frac{3}{4}$	$\frac{1}{4}$	$\frac{11}{16}$	$\frac{11}{16}$	$\frac{7}{8}$	$1\frac{1}{16}$	$1\frac{1}{16}$	$1\frac{3}{16}$
$\frac{3}{4}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{13}{16}$	$\frac{13}{16}$	$\frac{13}{16}$	$1\frac{5}{16}$	$1\frac{1}{4}$	$1\frac{5}{16}$
$\frac{3}{4}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{11}{16}$	$\frac{11}{16}$	$\frac{13}{16}$	$1\frac{3}{16}$	$1\frac{1}{8}$	$1\frac{1}{4}$
$\frac{3}{4}$	$\frac{1}{2}$	$\frac{3}{8}$	$\frac{11}{16}$	$\frac{11}{16}$	$\frac{15}{16}$	$1\frac{3}{16}$	$1\frac{1}{8}$	$1\frac{1}{4}$
$\frac{3}{4}$	$\frac{1}{2}$	$\frac{1}{4}$	$\frac{11}{16}$	$\frac{11}{16}$	1	$1\frac{3}{16}$	$1\frac{1}{8}$	$1\frac{1}{4}$

DIMENSIONS

Cast Iron Tees (Continued)

125 Lbs. Steam Pressure

175 Lbs. Water Pressure

SIZE			DIMENSIONS					
			A	B	C	D	E	F
$\frac{3}{4}$	$\frac{3}{8}$	$\frac{3}{4}$	$\frac{13}{16}$	$\frac{15}{16}$	$\frac{13}{16}$	$1\frac{5}{16}$	$1\frac{1}{4}$	$1\frac{5}{16}$
$\frac{3}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{11}{16}$	$\frac{3}{4}$	$\frac{13}{16}$	$1\frac{3}{16}$	$1\frac{1}{8}$	$1\frac{1}{4}$
$\frac{3}{4}$	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{11}{16}$	$\frac{3}{4}$	$\frac{15}{16}$	$1\frac{3}{16}$	$1\frac{1}{8}$	$1\frac{1}{4}$
$\frac{3}{4}$	$\frac{1}{4}$	$\frac{3}{4}$	$\frac{13}{16}$	1	$\frac{13}{16}$	$1\frac{5}{16}$	$1\frac{1}{4}$	$1\frac{5}{16}$
$\frac{3}{4}$	$\frac{1}{4}$	$\frac{1}{2}$	$\frac{11}{16}$	$\frac{13}{16}$	$\frac{13}{16}$	$1\frac{3}{16}$	$1\frac{1}{8}$	$1\frac{1}{4}$
$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{13}{16}$	$\frac{13}{16}$	$\frac{11}{16}$	$1\frac{1}{4}$	$1\frac{1}{4}$	$1\frac{3}{16}$
$\frac{3}{8}$	$\frac{3}{8}$	$\frac{3}{4}$	$\frac{15}{16}$	$\frac{15}{16}$	$\frac{11}{16}$	$1\frac{1}{4}$	$1\frac{1}{4}$	$1\frac{3}{16}$
1	1	1	$\frac{15}{16}$	$\frac{15}{16}$	$\frac{15}{16}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$
1	1	$\frac{3}{4}$	$\frac{13}{16}$	$\frac{13}{16}$	$\frac{15}{16}$	$1\frac{3}{8}$	$1\frac{3}{8}$	$1\frac{7}{16}$
1	1	$\frac{1}{2}$	$\frac{11}{16}$	$\frac{11}{16}$	$\frac{15}{16}$	$1\frac{1}{4}$	$1\frac{1}{4}$	$1\frac{3}{8}$
1	1	$\frac{3}{8}$	$\frac{11}{16}$	$\frac{11}{16}$	$\frac{11}{16}$	$1\frac{1}{4}$	$1\frac{1}{4}$	$1\frac{3}{8}$
1	1	$\frac{1}{4}$	$\frac{11}{16}$	$\frac{11}{16}$	$\frac{11}{16}$	$1\frac{1}{4}$	$1\frac{1}{4}$	$1\frac{3}{8}$
1	$\frac{3}{4}$	1	$\frac{15}{16}$	$\frac{15}{16}$	$\frac{15}{16}$	$1\frac{1}{2}$	$1\frac{7}{16}$	$1\frac{1}{2}$
1	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{13}{16}$	$\frac{13}{16}$	$\frac{15}{16}$	$1\frac{3}{8}$	$1\frac{5}{16}$	$1\frac{7}{16}$
1	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{11}{16}$	$\frac{11}{16}$	$\frac{15}{16}$	$1\frac{1}{4}$	$1\frac{3}{16}$	$1\frac{3}{8}$
1	$\frac{1}{2}$	1	$\frac{15}{16}$	$\frac{15}{16}$	$\frac{15}{16}$	$1\frac{1}{2}$	$1\frac{3}{8}$	$1\frac{1}{2}$
1	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{13}{16}$	$\frac{13}{16}$	$\frac{15}{16}$	$1\frac{3}{8}$	$1\frac{1}{4}$	$1\frac{7}{16}$
1	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{11}{16}$	$\frac{13}{16}$	$\frac{15}{16}$	$1\frac{1}{4}$	$1\frac{3}{16}$	$1\frac{3}{8}$
1	$\frac{3}{8}$	1	$\frac{15}{16}$	$\frac{1}{16}$	$\frac{15}{16}$	$1\frac{1}{2}$	$1\frac{3}{8}$	$1\frac{1}{2}$
1	$\frac{1}{4}$	1	$\frac{15}{16}$	$1\frac{1}{8}$	$\frac{15}{16}$	$1\frac{1}{2}$	$1\frac{3}{8}$	$1\frac{1}{2}$
$\frac{3}{4}$	$\frac{3}{4}$	1	$\frac{15}{16}$	$\frac{15}{16}$	$\frac{13}{16}$	$1\frac{7}{16}$	$1\frac{7}{16}$	$1\frac{3}{8}$
$\frac{3}{4}$	$\frac{1}{2}$	1	$\frac{15}{16}$	$\frac{1}{16}$	$\frac{13}{16}$	$1\frac{7}{16}$	$1\frac{7}{16}$	$1\frac{3}{8}$
$\frac{1}{2}$	$\frac{1}{2}$	1	1	1	$\frac{13}{16}$	$1\frac{7}{16}$	$1\frac{7}{16}$	$1\frac{3}{8}$
$1\frac{1}{4}$	$1\frac{1}{4}$	$1\frac{1}{4}$	$1\frac{1}{8}$	$1\frac{1}{8}$	$1\frac{1}{8}$	$1\frac{3}{4}$	$1\frac{3}{4}$	$1\frac{3}{4}$
$1\frac{1}{4}$	$1\frac{1}{4}$	1	$\frac{15}{16}$	$\frac{15}{16}$	$\frac{11}{16}$	$1\frac{9}{16}$	$1\frac{9}{16}$	$1\frac{11}{16}$
$1\frac{1}{4}$	$1\frac{1}{4}$	$\frac{3}{4}$	$\frac{13}{16}$	$\frac{13}{16}$	$\frac{11}{16}$	$1\frac{7}{16}$	$1\frac{7}{16}$	$1\frac{5}{8}$
$1\frac{1}{4}$	$1\frac{1}{4}$	$\frac{1}{2}$	$\frac{11}{16}$	$\frac{11}{16}$	$\frac{11}{16}$	$1\frac{5}{16}$	$1\frac{5}{16}$	$1\frac{9}{16}$
$1\frac{1}{4}$	$1\frac{1}{4}$	$\frac{3}{8}$	$\frac{11}{16}$	$\frac{11}{16}$	$\frac{11}{16}$	$1\frac{5}{16}$	$1\frac{5}{16}$	$1\frac{9}{16}$
$1\frac{1}{4}$	$1\frac{1}{4}$	$\frac{1}{4}$	$\frac{11}{16}$	$\frac{11}{16}$	$\frac{11}{16}$	$1\frac{5}{16}$	$1\frac{5}{16}$	$1\frac{9}{16}$
$1\frac{1}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{8}$	$1\frac{1}{8}$	$1\frac{1}{8}$	$1\frac{3}{4}$	$1\frac{11}{16}$	$1\frac{3}{4}$
$1\frac{1}{4}$	1	1	$\frac{15}{16}$	$\frac{15}{16}$	$\frac{11}{16}$	$1\frac{9}{16}$	$1\frac{1}{2}$	$1\frac{11}{16}$
$1\frac{1}{4}$	1	$\frac{3}{4}$	$\frac{13}{16}$	$\frac{13}{16}$	$\frac{11}{16}$	$1\frac{7}{16}$	$1\frac{3}{8}$	$1\frac{5}{8}$
$1\frac{1}{4}$	1	$\frac{1}{2}$	$\frac{11}{16}$	$\frac{11}{16}$	$\frac{11}{16}$	$1\frac{5}{16}$	$1\frac{1}{4}$	$1\frac{9}{16}$

DIMENSIONS

Cast Iron Tees (Continued)

125 Lbs. Steam Pressure

175 Lbs. Water Pressure

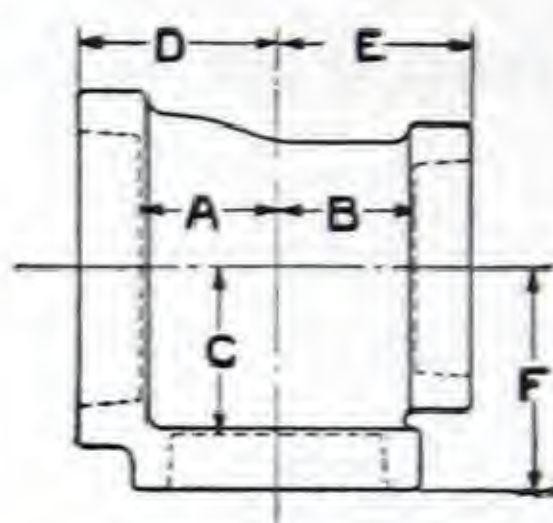


Fig. Nos. 358, 359

Dimensions A, B and C = End of Pipe
 Dimensions D, E and F = Face of Fitting

SIZE			DIMENSIONS					
			A	B	C	D	E	F
1 1/4	3/4	1 1/4	1 1/8	1 1/8	1 1/8	1 3/4	1 5/8	1 3/4
1 1/4	3/4	1	1 15/16	1 15/16	1 1/8	1 9/16	1 7/16	1 11/16
1 1/4	3/4	3/4	1 13/16	1 13/16	1 1/8	1 7/16	1 5/16	1 5/8
1 1/4	3/4	1/2	1 11/16	1 3/4	1 1/8	1 5/16	1 1/4	1 9/16
1 1/4	1/2	1 1/4	1 1/8	1 1/8	1 1/8	1 3/4	1 9/16	1 3/4
1 1/4	1/2	1	1 15/16	1 15/16	1 1/8	1 9/16	1 3/8	1 11/16
1 1/4	1/2	3/4	1 13/16	7/8	1 1/8	1 7/16	1 5/16	1 5/8
1 1/4	1/2	1/2	1 11/16	1 13/16	1 1/8	1 5/16	1 1/4	1 9/16
1 1/4	3/8	1 1/4	1 1/8	1 1/16	1 1/8	1 3/4	1 9/16	1 3/4
1 1/4	1/4	1 1/4	1 1/8	1 1/4	1 1/8	1 3/4	1 9/16	1 3/4
1	1	1 1/4	1 1/8	1 1/8	1 15/16	1 11/16	1 11/16	1 9/16
1	3/4	1 1/4	1 1/8	1 1/8	1 15/16	1 11/16	1 5/8	1 9/16
1	1/2	1 1/4	1 1/8	1 1/8	1 15/16	1 11/16	1 9/16	1 9/16
3/4	3/4	1 1/4	1 3/16	1 3/16	1 15/16	1 11/16	1 11/16	1 9/16
3/4	1/2	1 1/4	1 3/16	1 1/8	1 15/16	1 11/16	1 9/16	1 9/16
1 1/2	1 1/2	1 1/2	1 5/16	1 5/16	1 5/16	1 15/16	1 15/16	1 15/16
1 1/2	1 1/2	1 1/4	1 3/16	1 3/16	1 1/4	1 13/16	1 13/16	1 7/8
1 1/2	1 1/2	1	1	1	1 1/4	1 5/8	1 5/8	1 13/16
1 1/2	1 1/2	3/4	7/8	7/8	1 1/4	1 1/2	1 1/2	1 3/4
1 1/2	1 1/2	1/2	1 13/16	1 13/16	1 1/4	1 7/16	1 7/16	1 11/16
1 1/2	1 1/2	3/8	1 13/16	1 13/16	1 3/8	1 7/16	1 7/16	1 11/16
1 1/2	1 1/2	1/4	1 13/16	1 13/16	1 7/16	1 7/16	1 7/16	1 11/16
1 1/2	1 1/4	1 1/2	1 5/16	1 1/4	1 5/16	1 15/16	1 7/8	1 15/16
1 1/2	1 1/4	1 1/4	1 3/16	1 1/8	1 1/4	1 13/16	1 3/4	1 7/8
1 1/2	1 1/4	1	1	1 15/16	1 1/4	1 5/8	1 9/16	1 13/16
1 1/2	1 1/4	3/4	7/8	1 13/16	1 1/4	1 1/2	1 7/16	1 3/4
1 1/2	1 1/4	1/2	1 13/16	1 11/16	1 1/4	1 7/16	1 5/16	1 11/16

DIMENSIONS

Cast Iron Tees (Continued)

125 Lbs. Steam Pressure

175 Lbs. Water Pressure

SIZE			DIMENSIONS					
			A	B	C	D	E	F
1 1/2	1	1 1/2	1 5/16	1 1/4	1 5/16	1 15/16	1 13/16	1 15/16
1 1/2	1	1 1/4	1 3/16	1 1/8	1 1/4	1 13/16	1 11/16	1 7/8
1 1/2	1	1	1	15/16	1 1/4	1 5/8	1 1/2	1 13/16
1 1/2	1	3/4	7/8	13/16	1 1/4	1 1/2	1 3/8	1 3/4
1 1/2	1	1/2	13/16	3/4	1 1/4	1 7/16	1 5/16	1 11/16
1 1/2	3/4	1 1/2	1 5/16	1 1/4	1 5/16	1 15/16	1 3/4	1 15/16
1 1/2	3/4	1 1/4	1 3/16	1 3/16	1 1/4	1 13/16	1 11/16	1 7/8
1 1/2	3/4	1	1	1	1 1/4	1 5/8	1 1/2	1 13/16
1 1/2	3/4	3/4	7/8	7/8	1 1/4	1 1/2	1 3/8	1 3/4
1 1/2	3/4	1/2	13/16	13/16	1 1/4	1 7/16	1 5/16	1 11/16
1 1/2	1/2	1 1/2	1 5/16	1 1/4	1 5/16	1 15/16	1 11/16	1 15/16
1 1/2	1/2	1 1/4	1 3/16	1 1/8	1 1/4	1 13/16	1 9/16	1 7/8
1 1/2	1/2	1	1	1 1/16	1 1/4	1 5/8	1 1/2	1 13/16
1 1/2	1/2	3/4	7/8	15/16	1 1/4	1 1/2	1 3/8	1 3/4
1 1/2	1/2	1/2	13/16	7/8	1 1/4	1 7/16	1 5/16	1 11/16
1 1/2	3/8	1 1/2	1 5/16	1 3/8	1 5/16	1 15/16	1 11/16	1 15/16
1 1/2	1/4	1 1/2	1 5/16	1 7/16	1 5/16	1 15/16	1 11/16	1 15/16
1 1/4	1 1/4	1 1/2	1 1/4	1 1/4	1 3/16	1 7/8	1 7/8	1 13/16
1 1/4	1	1 1/2	1 1/4	1 1/4	1 3/16	1 7/8	1 13/16	1 13/16
1 1/4	3/4	1 1/2	1 1/4	1 1/4	1 3/16	1 7/8	1 3/4	1 13/16
1 1/4	1/2	1 1/2	1 1/4	1 5/16	1 3/16	1 7/8	1 3/4	1 13/16
1	1	1 1/2	1 1/4	1 1/4	1	1 13/16	1 13/16	1 5/8
1	3/4	1 1/2	1 1/4	1 5/16	1	1 13/16	1 13/16	1 5/8
3/4	3/4	1 1/2	1 5/16	1 5/16	1	1 13/16	1 13/16	1 5/8
2	2	2	1 9/16	1 9/16	1 9/16	2 1/4	2 1/4	2 1/4
2	2	1 1/2	1 5/16	1 5/16	1 1/2	2	2	2 1/8
2	2	1 1/4	1 3/16	1 3/16	1 7/16	1 7/8	1 7/8	2 1/16
2	2	1	1 1/16	1 1/16	1 7/16	1 3/4	1 3/4	2
2	2	3/4	7/8	7/8	1 7/16	1 9/16	1 9/16	1 15/16
2	2	1/2	13/16	13/16	1 7/16	1 1/2	1 1/2	1 7/8
2	2	3/8	13/16	13/16	1 1/2	1 1/2	1 1/2	1 7/8
2	2	1/4	13/16	13/16	1 9/16	1 1/2	1 1/2	1 7/8

DIMENSIONS Cast Iron Tees (Continued)

125 Lbs. Steam Pressure

175 Lbs. Water Pressure

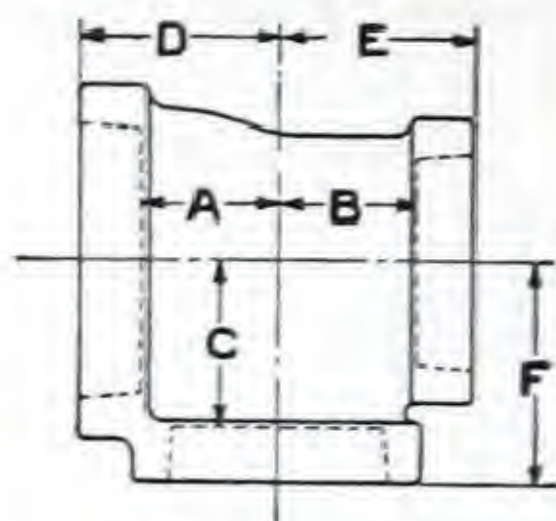


Fig. Nos. 358, 359

Dimensions A, B and C = End of Pipe
Dimensions D, E and F = Face of Fitting

SIZE			DIMENSIONS					
			A	B	C	D	E	F
2	1 1/2	2	1 9/16	1 1/2	1 9/16	2 1/4	2 1/8	2 1/4
2	1 1/2	1 1/2	1 5/16	1 5/16	1 1/2	2	1 15/16	2 1/8
2	1 1/2	1 1/4	1 3/16	1 3/16	1 7/16	1 7/8	1 13/16	2 1/16
2	1 1/2	1	1 1/16	1	1 7/16	1 3/4	1 5/8	2
2	1 1/2	3/4	7/8	7/8	1 7/16	1 9/16	1 1/2	1 15/16
2	1 1/2	1/2	13/16	13/16	1 7/16	1 1/2	1 7/16	1 7/8
2	1 1/4	2	1 9/16	1 7/16	1 9/16	2 1/4	2 1/16	2 1/4
2	1 1/4	1 1/2	1 5/16	1 1/4	1 1/2	2	1 7/8	2 1/8
2	1 1/4	1 1/4	1 3/16	1 1/8	1 7/16	1 7/8	1 3/4	2 1/16
2	1 1/4	1	1 1/16	1	1 7/16	1 3/4	1 5/8	2
2	1 1/4	3/4	7/8	7/8	1 7/16	1 9/16	1 1/2	1 15/16
2	1 1/4	1/2	13/16	13/16	1 7/16	1 1/2	1 7/16	1 7/8
2	1	2	1 9/16	1 7/16	1 9/16	2 1/4	2	2 1/4
2	1	1 1/2	1 5/16	1 1/4	1 1/2	2	1 13/16	2 1/8
2	1	1 1/4	1 3/16	1 3/16	1 7/16	1 7/8	1 3/4	2 1/16
2	1	1	1 1/16	1 1/16	1 7/16	1 3/4	1 5/8	2
2	3/4	3/4	7/8	15/16	1 5/16	1 9/16	1 1/2	1 15/16
2	3/4	2	1 9/16	1 7/16	1 9/16	2 1/4	1 15/16	2 1/4
2	3/4	1 1/2	1 5/16	1 5/16	1 1/2	2	1 13/16	2 1/8
2	3/4	1 1/4	1 3/16	1 1/4	1 7/16	1 7/8	1 3/4	2 1/16
2	3/4	1	1 1/16	1 1/8	1 7/16	1 3/4	1 5/8	2
2	3/4	3/4	7/8	1	1 7/16	1 9/16	1 1/2	1 15/16
2	3/4	1/2	13/16	15/16	1 7/16	1 1/2	1 7/16	1 7/8
2	1/2	2	1 9/16	1 7/16	1 9/16	2 1/4	1 7/8	2 1/4
2	1/2	1 1/2	1 5/16	1 3/8	1 1/2	2	1 13/16	2 1/8
2	1/2	1 1/4	1 3/16	1 5/16	1 7/16	1 7/8	1 3/4	2 1/16

DIMENSIONS

Cast Iron Tees (Continued)

125 Lbs. Steam Pressure

175 Lbs. Water Pressure

SIZE			DIMENSIONS					
			A	B	C	D	E	F
2	$\frac{1}{2}$	$\frac{1}{2}$	$1\frac{13}{16}$	1	$1\frac{7}{16}$	$1\frac{1}{2}$	$1\frac{7}{16}$	$1\frac{7}{8}$
2	$\frac{3}{8}$	2	$1\frac{9}{16}$	$1\frac{1}{2}$	$1\frac{9}{16}$	$2\frac{1}{4}$	$1\frac{7}{8}$	$2\frac{1}{4}$
2	$\frac{1}{4}$	2	$1\frac{9}{16}$	$1\frac{9}{16}$	$1\frac{9}{16}$	$2\frac{1}{4}$	$1\frac{7}{8}$	$2\frac{1}{4}$
$1\frac{1}{2}$	$1\frac{1}{2}$	2	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{5}{16}$	$2\frac{1}{8}$	$2\frac{1}{8}$	2
$1\frac{1}{2}$	$1\frac{1}{4}$	2	$1\frac{1}{2}$	$1\frac{7}{16}$	$1\frac{5}{16}$	$2\frac{1}{8}$	$2\frac{1}{16}$	2
$1\frac{1}{2}$	1	2	$1\frac{1}{2}$	$1\frac{7}{16}$	$1\frac{5}{16}$	$2\frac{1}{8}$	2	2
$1\frac{1}{2}$	$\frac{3}{4}$	2	$1\frac{1}{2}$	$1\frac{7}{16}$	$1\frac{5}{16}$	$2\frac{1}{8}$	$1\frac{15}{16}$	2
$1\frac{1}{4}$	$1\frac{1}{4}$	2	$1\frac{7}{16}$	$1\frac{7}{16}$	$1\frac{3}{16}$	$2\frac{1}{16}$	$2\frac{1}{16}$	$1\frac{7}{8}$
$1\frac{1}{4}$	1	2	$1\frac{7}{16}$	$1\frac{7}{16}$	$1\frac{3}{16}$	$2\frac{1}{16}$	2	$1\frac{7}{8}$
$1\frac{1}{4}$	$\frac{3}{4}$	2	$1\frac{7}{16}$	$1\frac{1}{2}$	$1\frac{3}{16}$	$2\frac{1}{16}$	2	$1\frac{7}{8}$
1	1	2	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{3}{16}$	$2\frac{1}{16}$	$2\frac{1}{16}$	$1\frac{7}{8}$
1	$\frac{3}{4}$	2	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{3}{16}$	$2\frac{1}{16}$	2	$1\frac{7}{8}$
$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{1}{2}$	$1\frac{13}{16}$	$1\frac{13}{16}$	$1\frac{13}{16}$	$2\frac{11}{16}$	$2\frac{11}{16}$	$2\frac{11}{16}$
$2\frac{1}{2}$	$2\frac{1}{2}$	2	$1\frac{9}{16}$	$1\frac{9}{16}$	$1\frac{7}{8}$	$2\frac{7}{16}$	$2\frac{7}{16}$	$2\frac{7}{16}$
$2\frac{1}{2}$	$2\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{5}{16}$	$1\frac{5}{16}$	$1\frac{13}{16}$	$2\frac{3}{16}$	$2\frac{3}{16}$	$2\frac{7}{16}$
$2\frac{1}{2}$	$2\frac{1}{2}$	$1\frac{1}{4}$	$1\frac{3}{16}$	$1\frac{3}{16}$	$1\frac{3}{4}$	$2\frac{1}{16}$	$2\frac{1}{16}$	$2\frac{3}{8}$
$2\frac{1}{2}$	$2\frac{1}{2}$	1	1	1	$1\frac{3}{4}$	$1\frac{15}{16}$	$1\frac{15}{16}$	$2\frac{5}{16}$
$2\frac{1}{2}$	$2\frac{1}{2}$	$\frac{3}{4}$	$\frac{7}{8}$	$\frac{7}{8}$	$1\frac{3}{4}$	$1\frac{3}{4}$	$1\frac{3}{4}$	$2\frac{1}{4}$
$2\frac{1}{2}$	$2\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{3}{4}$	$1\frac{3}{4}$	$1\frac{11}{16}$	$1\frac{11}{16}$	$2\frac{3}{16}$
$2\frac{1}{2}$	2	$2\frac{1}{2}$	$1\frac{13}{16}$	$1\frac{7}{8}$	$1\frac{13}{16}$	$2\frac{11}{16}$	$2\frac{9}{16}$	$2\frac{11}{16}$
$2\frac{1}{2}$	2	2	$1\frac{9}{16}$	$1\frac{9}{16}$	$1\frac{7}{8}$	$2\frac{7}{16}$	$2\frac{1}{4}$	$2\frac{9}{16}$
$2\frac{1}{2}$	2	$1\frac{1}{2}$	$1\frac{5}{16}$	$1\frac{5}{16}$	$1\frac{13}{16}$	$2\frac{3}{16}$	2	$2\frac{7}{16}$
$2\frac{1}{2}$	2	$1\frac{1}{4}$	$1\frac{3}{16}$	$1\frac{3}{16}$	$1\frac{3}{4}$	$2\frac{1}{16}$	$1\frac{7}{8}$	$2\frac{3}{8}$
$2\frac{1}{2}$	2	1	1	$1\frac{1}{16}$	$1\frac{3}{4}$	$1\frac{15}{16}$	$1\frac{3}{4}$	$2\frac{5}{16}$
$2\frac{1}{2}$	2	$\frac{3}{4}$	$\frac{7}{8}$	$\frac{7}{8}$	$1\frac{3}{4}$	$1\frac{3}{4}$	$1\frac{9}{16}$	$2\frac{1}{4}$
$2\frac{1}{2}$	2	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{13}{16}$	$1\frac{3}{4}$	$1\frac{11}{16}$	$1\frac{1}{2}$	$2\frac{3}{16}$
$2\frac{1}{2}$	$1\frac{1}{2}$	$2\frac{1}{2}$	$1\frac{13}{16}$	$1\frac{13}{16}$	$1\frac{13}{16}$	$2\frac{11}{16}$	$2\frac{7}{16}$	$2\frac{11}{16}$
$2\frac{1}{2}$	$1\frac{1}{2}$	2	$1\frac{9}{16}$	$1\frac{1}{2}$	$1\frac{7}{8}$	$2\frac{7}{16}$	$2\frac{1}{8}$	$2\frac{9}{16}$
$2\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{5}{16}$	$1\frac{5}{16}$	$1\frac{13}{16}$	$2\frac{3}{16}$	$1\frac{15}{16}$	$2\frac{7}{16}$
$2\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{4}$	$1\frac{3}{16}$	$1\frac{3}{16}$	$1\frac{3}{4}$	$2\frac{1}{16}$	$1\frac{7}{8}$	$2\frac{3}{8}$
$2\frac{1}{2}$	$1\frac{1}{2}$	1	1	$1\frac{1}{8}$	$1\frac{3}{4}$	$1\frac{15}{16}$	$1\frac{3}{4}$	$2\frac{5}{16}$
$2\frac{1}{2}$	$1\frac{1}{2}$	$\frac{3}{4}$	$\frac{7}{8}$	$\frac{15}{16}$	$1\frac{3}{4}$	$1\frac{3}{4}$	$1\frac{9}{16}$	$2\frac{1}{4}$

DIMENSIONS

Cast Iron Tees (Continued)

125 Lbs. Steam Pressure

175 Lbs. Water Pressure

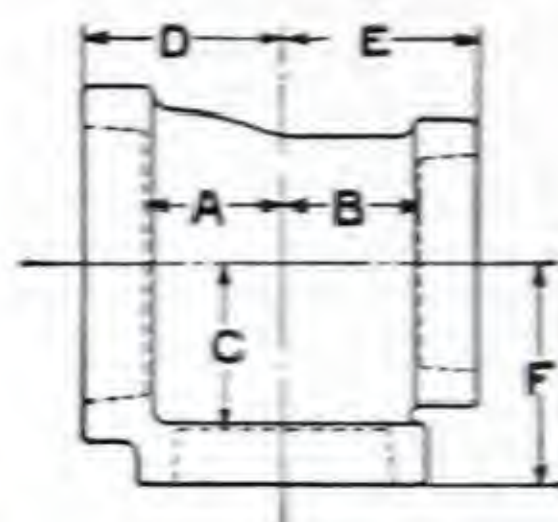


Fig. Nos. 358, 359

Dimensions A, B and C = End of Pipe
 Dimensions D, E and F = Face of Fitting

SIZE			DIMENSIONS					
			A	B	C	D	E	F
2 1/2	1 1/4	2 1/2	1 13/16	1 3/4	1 13/16	2 11/16	2 3/8	2 11/16
2 1/2	1 1/4	2	1 9/16	1 1/2	1 7/8	2 7/16	2 1/8	2 9/16
2 1/2	1 1/4	1 1/2	1 5/16	1 5/16	1 13/16	2 3/16	1 15/16	2 7/16
2 1/2	1 1/4	1 1/4	1 3/16	1 1/4	1 3/4	2 1/16	1 7/8	2 3/8
2 1/2	1 1/4	1	1	1 1/8	1 3/4	1 15/16	1 3/4	2 5/16
2 1/2	1	2 1/2	1 13/16	1 3/4	1 13/16	2 11/16	2 5/16	2 11/16
2 1/2	1	2	1 9/16	1 9/16	1 7/8	2 7/16	2 1/8	2 9/16
2 1/2	1	1 1/2	1 5/16	1 3/8	1 13/16	2 3/16	1 15/16	2 7/16
2 1/2	1	1	1	1 3/16	1 3/4	1 15/16	1 3/4	2 5/16
2 1/2	3/4	2 1/2	1 13/16	1 3/4	1 13/16	2 11/16	2 1/4	2 11/16
2 1/2	3/4	2	1 9/16	1 5/8	1 7/8	2 7/16	2 1/8	2 9/16
2 1/2	3/4	1 1/2	1 5/16	1 7/16	1 13/16	2 3/16	1 15/16	2 7/16
2 1/2	1/2	2 1/2	1 13/16	1 13/16	1 13/16	2 11/16	2 1/4	2 11/16
2 1/2	1/2	2	1 9/16	1 11/16	1 7/8	2 7/16	2 1/8	2 9/16
2	2	2 1/2	1 7/8	1 7/8	1 9/16	2 9/16	2 9/16	2 7/16
2	1 1/2	2 1/2	1 7/8	1 15/16	1 9/16	2 9/16	2 9/16	2 7/16
2	1 1/4	2 1/2	1 7/8	1 3/4	1 9/16	2 9/16	2 3/8	2 7/16
2	1	2 1/2	1 7/8	1 13/16	1 9/16	2 9/16	2 3/8	2 7/16
2	3/4	2 1/2	1 7/8	1 7/8	1 9/16	2 9/16	2 3/8	2 7/16
1 1/2	1 1/2	2 1/2	1 13/16	1 13/16	1 5/16	2 7/16	2 7/16	2 3/16
1 1/2	1 1/4	2 1/2	1 13/16	1 13/16	1 5/16	2 7/16	2 7/16	2 3/16
1 1/2	1	2 1/2	1 13/16	1 7/8	1 5/16	2 7/16	2 7/16	2 3/16
1 1/4	1 1/4	2 1/2	1 13/16	1 13/16	1 5/16	2 7/16	2 7/16	2 3/16

DIMENSIONS

Cast Iron Tees (Continued)

125 Lbs. Steam Pressure

175 Lbs. Water Pressure

SIZE			DIMENSIONS					
			A	B	C	D	E	F
3	3	3	$2\frac{3}{16}$	$2\frac{3}{16}$	$2\frac{3}{16}$	$3\frac{1}{8}$	$3\frac{1}{8}$	$3\frac{1}{8}$
3	3	$2\frac{1}{2}$	$1\frac{7}{8}$	$1\frac{7}{8}$	$2\frac{3}{16}$	$2\frac{13}{16}$	$2\frac{13}{16}$	$3\frac{1}{16}$
3	3	2	$1\frac{5}{8}$	$1\frac{5}{8}$	$2\frac{1}{4}$	$2\frac{9}{16}$	$2\frac{9}{16}$	$2\frac{15}{16}$
3	3	$1\frac{1}{2}$	$1\frac{3}{8}$	$1\frac{3}{8}$	$2\frac{3}{16}$	$2\frac{5}{16}$	$2\frac{5}{16}$	$2\frac{13}{16}$
3	3	$1\frac{1}{4}$	$1\frac{1}{4}$	$1\frac{1}{4}$	$2\frac{1}{8}$	$2\frac{3}{16}$	$2\frac{3}{16}$	$2\frac{3}{4}$
3	3	1	$1\frac{1}{16}$	$1\frac{1}{16}$	$2\frac{1}{8}$	$2\frac{1}{16}$	$2\frac{1}{16}$	$2\frac{11}{16}$
3	3	$\frac{3}{4}$	$1\frac{15}{16}$	$1\frac{15}{16}$	$2\frac{1}{8}$	$1\frac{7}{8}$	$1\frac{7}{8}$	$2\frac{5}{8}$
3	3	$\frac{1}{2}$	$1\frac{15}{16}$	$1\frac{15}{16}$	$2\frac{3}{16}$	$1\frac{7}{8}$	$1\frac{7}{8}$	$2\frac{5}{8}$
3	$2\frac{1}{2}$	3	$2\frac{3}{16}$	$2\frac{3}{16}$	$2\frac{3}{16}$	$3\frac{1}{8}$	$3\frac{1}{16}$	$3\frac{1}{8}$
3	$2\frac{1}{2}$	$2\frac{1}{2}$	$1\frac{7}{8}$	$1\frac{13}{16}$	$2\frac{3}{16}$	$2\frac{13}{16}$	$2\frac{11}{16}$	$3\frac{1}{16}$
3	$2\frac{1}{2}$	2	$1\frac{5}{8}$	$1\frac{9}{16}$	$2\frac{1}{4}$	$2\frac{9}{16}$	$2\frac{7}{16}$	$2\frac{15}{16}$
3	$2\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{3}{8}$	$1\frac{5}{16}$	$2\frac{3}{16}$	$2\frac{5}{16}$	$2\frac{3}{16}$	$2\frac{13}{16}$
3	$2\frac{1}{2}$	$1\frac{1}{4}$	$1\frac{1}{4}$	$1\frac{3}{16}$	$2\frac{1}{8}$	$2\frac{3}{16}$	$2\frac{1}{16}$	$2\frac{3}{4}$
3	$2\frac{1}{2}$	1	$1\frac{1}{16}$	1	$2\frac{1}{8}$	$2\frac{1}{16}$	$1\frac{15}{16}$	$2\frac{11}{16}$
3	$2\frac{1}{2}$	$\frac{3}{4}$	$1\frac{1}{16}$	1	$2\frac{3}{16}$	$2\frac{1}{16}$	$1\frac{15}{16}$	$2\frac{11}{16}$
3	$2\frac{1}{2}$	$\frac{1}{2}$	$1\frac{1}{16}$	1	$2\frac{1}{4}$	$2\frac{1}{16}$	$1\frac{15}{16}$	$2\frac{11}{16}$
3	2	3	$2\frac{3}{16}$	$2\frac{1}{4}$	$2\frac{3}{16}$	$3\frac{1}{8}$	$2\frac{15}{16}$	$3\frac{1}{8}$
3	2	$2\frac{1}{2}$	$1\frac{7}{8}$	$1\frac{7}{8}$	$2\frac{3}{16}$	$2\frac{13}{16}$	$2\frac{9}{16}$	$3\frac{1}{16}$
3	2	2	$1\frac{5}{8}$	$1\frac{3}{4}$	$2\frac{1}{4}$	$2\frac{9}{16}$	$2\frac{7}{16}$	$2\frac{15}{16}$
3	2	$1\frac{1}{2}$	$1\frac{3}{8}$	$1\frac{1}{2}$	$2\frac{3}{16}$	$2\frac{5}{16}$	$2\frac{3}{16}$	$2\frac{13}{16}$
3	2	$1\frac{1}{4}$	$1\frac{1}{4}$	$1\frac{3}{8}$	$2\frac{1}{8}$	$2\frac{3}{16}$	$2\frac{1}{16}$	$2\frac{3}{4}$
3	2	1	$1\frac{1}{16}$	$1\frac{1}{4}$	$2\frac{1}{8}$	$2\frac{1}{16}$	$1\frac{15}{16}$	$2\frac{11}{16}$
3	2	$\frac{3}{4}$	$1\frac{1}{16}$	$1\frac{1}{4}$	$2\frac{3}{16}$	$2\frac{1}{16}$	$1\frac{15}{16}$	$2\frac{11}{16}$
3	$1\frac{1}{2}$	3	$2\frac{3}{16}$	$2\frac{3}{16}$	$2\frac{3}{16}$	$3\frac{1}{8}$	$2\frac{13}{16}$	$3\frac{1}{8}$
3	$1\frac{1}{2}$	$2\frac{1}{2}$	$1\frac{7}{8}$	$1\frac{15}{16}$	$2\frac{3}{16}$	$2\frac{13}{16}$	$2\frac{9}{16}$	$3\frac{1}{16}$
3	$1\frac{1}{2}$	2	$1\frac{5}{8}$	$1\frac{13}{16}$	$2\frac{1}{4}$	$2\frac{9}{16}$	$2\frac{7}{16}$	$2\frac{15}{16}$
3	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{3}{8}$	$1\frac{9}{16}$	$2\frac{3}{16}$	$2\frac{5}{16}$	$2\frac{3}{16}$	$2\frac{13}{16}$
3	$1\frac{1}{2}$	$1\frac{1}{4}$	$1\frac{1}{4}$	$1\frac{7}{16}$	$2\frac{1}{8}$	$2\frac{3}{16}$	$2\frac{1}{16}$	$2\frac{3}{4}$
3	$1\frac{1}{4}$	3	$2\frac{3}{16}$	$2\frac{3}{16}$	$2\frac{3}{16}$	$3\frac{1}{8}$	$2\frac{13}{16}$	$3\frac{1}{8}$
3	$1\frac{1}{4}$	$2\frac{1}{2}$	$1\frac{7}{8}$	$1\frac{15}{16}$	$2\frac{3}{16}$	$2\frac{13}{16}$	$2\frac{9}{16}$	$3\frac{1}{16}$
3	$1\frac{1}{4}$	2	$1\frac{5}{8}$	$1\frac{13}{16}$	$2\frac{1}{4}$	$2\frac{9}{16}$	$2\frac{7}{16}$	$2\frac{15}{16}$
3	1	3	$2\frac{3}{16}$	$2\frac{1}{4}$	$2\frac{3}{16}$	$3\frac{1}{8}$	$2\frac{13}{16}$	$3\frac{1}{8}$
3	1	$2\frac{1}{2}$	$1\frac{7}{8}$	2	$2\frac{3}{16}$	$2\frac{13}{16}$	$2\frac{9}{16}$	$3\frac{1}{16}$
3	$\frac{3}{4}$	3	$2\frac{3}{16}$	$2\frac{5}{16}$	$2\frac{3}{16}$	$3\frac{1}{8}$	$2\frac{13}{16}$	$3\frac{1}{8}$

DIMENSIONS

Cast Iron Tees (Continued)

125 Lbs. Steam Pressure

175 Lbs. Water Pressure

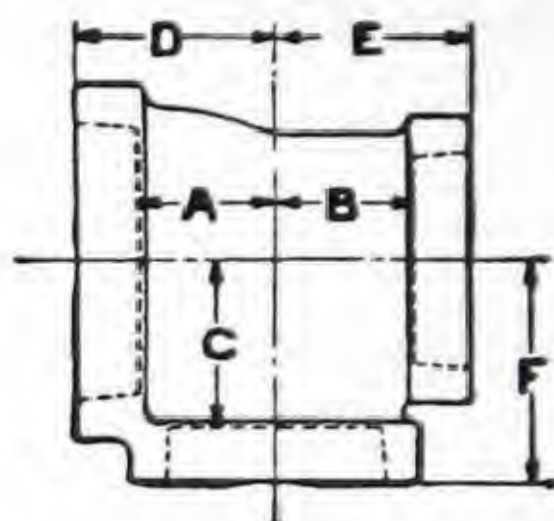


Fig. Nos. 358, 359

Dimensions A, B and C = End of Pipe
 Dimensions D, E and F = Face of Fitting

SIZE			DIMENSIONS					
			A	B	C	D	E	F
3	1/2	3	2 3/16	2 3/8	2 3/16	3 1/8	2 13/16	3 1/8
2 1/2	2 1/2	3	2 3/16	2 3/16	1 7/8	3 1/16	3 1/16	2 13/16
2 1/2	2	3	2 3/16	2 1/4	1 7/8	3 1/16	2 15/16	2 13/16
2 1/2	1 1/2	3	2 3/16	2 5/16	1 7/8	3 1/16	2 15/16	2 13/16
2 1/2	1 1/4	3	2 3/16	2 5/16	1 7/8	3 1/16	2 15/16	2 13/16
2 1/2	1	3	2 3/16	2 3/8	1 7/8	3 1/16	2 15/16	2 13/16
2	2	3	2 3/8	2 3/8	1 7/8	3 1/16	3 1/16	2 13/16
2	1 1/2	3	2 3/8	2 5/16	1 7/8	3 1/16	2 15/16	2 13/16
1 1/2	1 1/2	3	2 7/16	2 5/16	1 7/8	3 1/16	2 15/16	2 3/16
3 1/2	3 1/2	3 1/2	2 7/16	2 7/16	2 7/16	3 7/16	3 7/16	3 7/16
3 1/2	3 1/2	3	2 3/16	2 3/16	2 7/16	3 3/16	3 3/16	3 3/8
3 1/2	3 1/2	2 1/2	1 7/8	1 7/8	2 7/16	2 7/8	2 7/8	3 5/16
3 1/2	3 1/2	2	1 5/8	1 5/8	2 1/2	2 5/8	2 5/8	3 3/16
3 1/2	3 1/2	1 1/2	1 3/8	1 3/8	2 7/16	2 3/8	2 3/8	3 1/16
3 1/2	3 1/2	1 1/4	1 1/4	1 1/4	2 3/8	2 1/4	2 1/4	3
3 1/2	3 1/2	1	1 1/16	1 1/16	2 3/8	2 1/8	2 1/8	2 15/16
3 1/2	3 1/2	3/4	1 1/16	1 1/16	2 7/16	2 1/8	2 1/8	2 15/16
3 1/2	3 1/2	1/2	1 1/16	1 1/16	2 1/2	2 1/8	2 1/8	2 15/16
3 1/2	3	3 1/2	2 7/16	2 1/2	2 7/16	3 7/16	3 7/16	3 7/16
3 1/2	3	3	2 3/16	2 3/16	2 7/16	3 3/16	3 1/8	3 3/8
3 1/2	3	2 1/2	1 7/8	1 7/8	2 7/16	2 7/8	2 13/16	3 5/16
3 1/2	3	2	1 5/8	1 5/8	2 1/2	2 5/8	2 9/16	3 3/16
3 1/2	3	1 1/2	1 3/8	1 3/8	2 7/16	2 3/8	2 5/16	3 1/16
3 1/2	3	1 1/4	1 1/4	1 1/4	2 3/8	2 1/4	2 3/16	3
3 1/2	3	1	1 1/16	1 1/16	2 3/8	2 1/8	2 1/16	2 15/16
3 1/2	3	3/4	1 1/16	1 1/16	2 7/16	2 1/8	2 1/16	2 15/16

DIMENSIONS

Cast Iron Tees (Continued)

125 Lbs. Steam Pressure

175 Lbs. Water Pressure

SIZE			DIMENSIONS					
			A	B	C	D	E	F
3 1/2	2 1/2	3 1/2	2 7/16	2 7/16	2 7/16	3 7/16	3 5/16	3 7/16
3 1/2	2 1/2	3	2 3/16	2 3/16	2 7/16	3 3/16	3 1/16	3 3/8
3 1/2	2 1/2	2 1/2	1 7/8	1 7/8	2 7/16	2 7/8	2 13/16	3 5/16
3 1/2	2 1/2	2	1 5/8	1 5/8	2 1/2	2 5/8	2 9/16	3 3/16
3 1/2	2 1/2	1 1/2	1 3/8	1 3/8	2 7/16	2 3/8	2 5/16	3 1/16
3 1/2	2	3 1/2	2 7/16	2 5/8	2 7/16	3 7/16	3 5/16	3 7/16
3 1/2	2	3	2 3/16	2 3/8	2 7/16	3 3/16	3 1/16	3 3/8
3 1/2	2	2 1/2	1 7/8	2 1/8	2 7/16	2 7/8	2 13/16	3 5/16
3 1/2	2	2	1 5/8	1 7/8	2 1/2	2 5/8	2 9/16	3 3/16
3 1/2	1 1/2	3 1/2	2 7/16	2 11/16	2 7/16	3 7/16	3 5/16	3 7/16
3 1/2	1 1/2	3	2 3/16	2 1/16	2 7/16	3 3/16	3 1/16	3 3/8
3 1/2	1 1/2	2 1/2	1 7/8	2 3/16	2 7/16	2 7/8	2 13/16	3 5/16
3 1/2	1 1/4	3 1/2	2 7/16	2 11/16	2 7/16	3 7/16	3 5/16	3 7/16
3 1/2	1	3 1/2	2 7/16	2 3/4	2 7/16	3 7/16	3 5/16	3 7/16
3 1/2	3/4	3 1/2	2 7/16	2 13/16	2 7/16	3 7/16	3 5/16	3 7/16
3	3	3 1/2	2 7/16	2 7/16	2 3/16	3 3/8	3 3/8	3 3/16
3	2 1/2	3 1/2	2 7/16	2 7/16	2 3/16	3 3/8	3 5/16	3 3/16
3	2	3 1/2	2 7/16	2 5/8	2 3/16	3 3/8	3 5/16	3 3/16
3	1 1/2	3 1/2	2 7/16	2 11/16	2 3/16	3 3/8	3 5/16	3 3/16
2 1/2	2 1/2	3 1/2	2 7/16	2 7/16	1 7/8	3 5/16	3 5/16	2 7/8
2 1/2	2	3 1/2	2 7/16	2 5/8	1 7/8	3 5/16	3 5/16	2 7/8
2	2	3 1/2	2 5/8	2 5/8	1 7/8	3 5/16	3 5/16	2 7/8
4	4	4	2 11/16	2 11/16	2 11/16	3 3/4	3 3/4	3 3/4
4	4	3 1/2	2 11/16	2 11/16	2 3/4	3 3/4	3 3/4	3 3/4
4	4	3	2 3/16	2 3/16	2 11/16	3 1/4	3 1/4	3 5/8
4	4	2 1/2	1 7/8	1 7/8	2 11/16	2 15/16	2 15/16	3 9/16
4	4	2	1 5/8	1 5/8	2 13/16	2 11/16	2 11/16	3 1/2
4	4	1 1/2	1 3/8	1 3/8	2 11/16	2 7/16	2 7/16	3 5/16
4	4	1 1/4	1 1/4	1 1/4	2 11/16	2 5/16	2 5/16	3 5/16
4	4	1	1 1/4	1 1/4	2 3/4	2 5/16	2 5/16	3 5/16
4	4	3/4	1 1/4	1 1/4	2 13/16	2 5/16	2 5/16	3 5/16
4	4	1/2	1 1/4	1 1/4	2 7/8	2 5/16	2 5/16	3 5/16

DIMENSIONS Cast Iron Tees (Continued)

125 Lbs. Steam Pressure

175 Lbs. Water Pressure

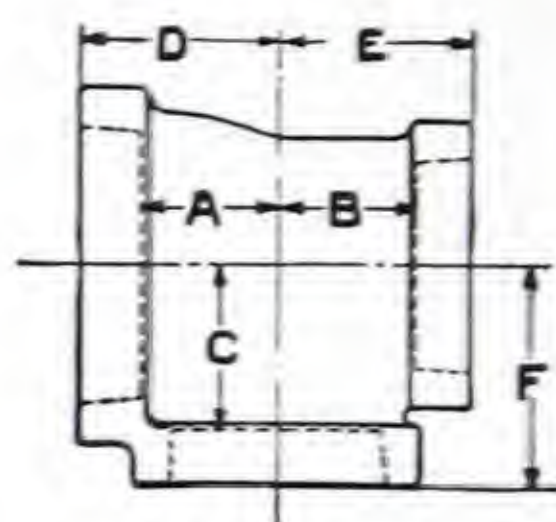


Fig. Nos. 358, 359

Dimensions A, B and C = Ends of Pipe
Dimensions D, E and F = Face of Fitting

SIZE			DIMENSIONS					
			A	B	C	D	E	F
4	3 1/2	4	2 11/16	2 3/4	2 11/16	3 3/4	3 3/4	3 3/4
4	3 1/2	3 1/2	2 7/16	2 7/16	2 11/16	3 1/2	3 7/16	3 11/16
4	3 1/2	3	2 3/16	2 1/4	2 11/16	3 1/4	3 1/4	3 5/8
4	3 1/2	2 1/2	1 7/8	1 7/8	2 11/16	2 15/16	2 7/8	3 9/16
4	3 1/2	2	1 5/8	1 5/8	2 13/16	2 11/16	2 5/8	3 1/2
4	3 1/2	1 1/2	1 3/8	1 3/8	2 11/16	2 7/16	2 3/8	3 5/16
4	3 1/2	1 1/4	1 1/4	1 1/4	2 11/16	2 5/16	2 1/4	3 5/16
4	3 1/2	1	1 1/4	1 1/4	2 3/4	2 5/16	2 1/4	3 5/16
4	3	4	2 11/16	2 11/16	2 11/16	3 3/4	3 5/8	3 3/4
4	3	3 1/2	2 7/16	2 1/2	2 11/16	3 1/2	3 7/16	3 11/16
4	3	3	2 3/16	2 3/16	2 11/16	3 1/4	3 1/8	3 5/8
4	3	2 1/2	1 7/8	1 7/8	2 11/16	2 15/16	2 13/16	3 9/16
4	3	2	1 5/8	1 5/8	2 13/16	2 11/16	2 9/16	3 1/2
4	3	1 1/2	1 3/8	1 7/16	2 11/16	2 7/16	2 3/8	3 5/16
4	3	1 1/4	1 1/4	1 5/16	2 11/16	2 5/16	2 1/4	3 5/16
4	3	1	1 1/4	1 5/16	2 3/4	2 5/16	2 1/4	3 5/16
4	2 1/2	4	2 11/16	2 3/4	2 11/16	3 3/4	3 5/8	3 3/4
4	2 1/2	3 1/2	2 7/16	2 9/16	2 11/16	3 1/2	3 7/16	3 11/16
4	2 1/2	3	2 3/16	2 1/4	2 11/16	3 1/4	3 1/8	3 5/8
4	2 1/2	2 1/2	1 7/8	1 15/16	2 11/16	2 15/16	2 13/16	3 9/16
4	2 1/2	2	1 5/8	1 11/16	2 13/16	2 11/16	2 9/16	3 1/2
4	2	4	2 11/16	2 13/16	2 11/16	3 3/4	3 1/2	3 3/4
4	2	3 1/2	2 11/16	2 13/16	2 3/4	3 3/4	3 1/2	3 3/4
4	2	3	2 3/16	2 7/16	2 11/16	3 1/4	3 1/8	3 5/8
4	2	2 1/2	1 7/8	2 1/8	2 11/16	2 15/16	2 13/16	3 9/16
4	2	2	1 5/8	1 7/8	2 13/16	2 11/16	2 9/16	3 1/2

DIMENSIONS

Cast Iron Tees (Continued)

125 Lbs. Steam Pressure

175 Lbs. Water Pressure

SIZE			DIMENSIONS					
			A	B	C	D	E	F
4	1 1/2	4	2 11/16	2 7/8	2 3/4	3 3/4	3 1/2	3 3/4
4	1 1/2	3 1/2	2 11/16	2 7/8	2 3/4	3 3/4	3 1/2	3 3/4
4	1 1/2	3	2 3/16	2 1/2	2 11/16	3 1/4	3 1/8	3 5/8
4	1 1/4	4	2 11/16	2 7/8	2 11/16	3 3/4	3 1/2	3 3/4
4	1	4	2 11/16	2 15/16	2 11/16	3 3/4	3 1/2	3 3/4
4	3/4	4	2 11/16	3	2 11/16	3 3/4	3 1/2	3 3/4
3 1/2	3 1/2	4	2 11/16	2 11/16	2 7/16	3 11/16	3 11/16	3 1/2
3 1/2	3	4	2 11/16	2 3/4	2 7/16	3 11/16	3 11/16	3 1/2
3 1/2	2 1/2	4	2 11/16	2 13/16	2 7/16	3 11/16	3 11/16	3 1/2
3 1/2	2	4	2 11/16	3	2 7/16	3 11/16	3 11/16	3 1/2
3	3	4	2 11/16	2 11/16	2 3/16	3 5/8	3 5/8	3 1/4
3	2 1/2	4	2 11/16	2 3/4	2 3/16	3 5/8	3 5/8	3 1/4
3	2	4	2 11/16	2 15/16	2 3/16	3 5/8	3 5/8	3 1/4
2 1/2	2 1/2	4	2 3/4	2 3/4	2 3/16	3 5/8	3 5/8	3 1/4
2 1/2	2	4	2 3/4	2 15/16	2 3/16	3 5/8	3 5/8	3 1/4
2	2	4	2 15/16	2 15/16	2 3/16	3 5/8	3 5/8	3 1/4
4 1/2	4 1/2	4 1/2	3	3	3	4 1/8	4 1/8	4 1/8
4 1/2	4 1/2	3	2 1/4	2 1/4	3	3 3/8	3 3/8	4
4 1/2	4 1/2	2	1 11/16	1 11/16	3 1/8	2 13/16	2 13/16	3 13/16
5	5	5	3 5/16	3 5/16	3 5/16	4 1/2	4 1/2	4 1/2
5	5	4	2 13/16	2 13/16	3 5/16	4	4	4 3/8
5	5	3 1/2	2 13/16	2 13/16	3 3/8	4	4	4 3/8
5	5	3	2 5/16	2 5/16	3 5/16	3 1/2	3 1/2	4 5/16
5	5	2 1/2	2	2	3 5/16	3 3/16	3 3/16	4 1/4
5	5	2	1 3/4	1 3/4	3 7/16	2 15/16	2 15/16	4 1/8
5	5	1 1/2	1 1/2	1 1/2	3 3/8	2 11/16	2 11/16	4
5	5	1 1/4	1 3/8	1 3/8	3 5/16	2 9/16	2 9/16	3 15/16
5	5	1	1 3/8	1 3/8	3 3/8	2 9/16	2 9/16	3 15/16
5	5	3/4	1 3/8	1 3/8	3 7/16	2 9/16	2 9/16	3 15/16
5	4	5	3 5/16	3 5/16	3 5/16	4 1/2	4 3/8	4 1/2
5	4	4	2 13/16	2 11/16	3 5/16	4	3 3/4	4 3/8
5	4	3 1/2	2 9/16	2 7/16	3 5/16	3 3/4	3 1/2	4 5/16

DIMENSIONS

Cast Iron Tees (Continued)

125 Lbs. Steam Pressure

175 Lbs. Water Pressure

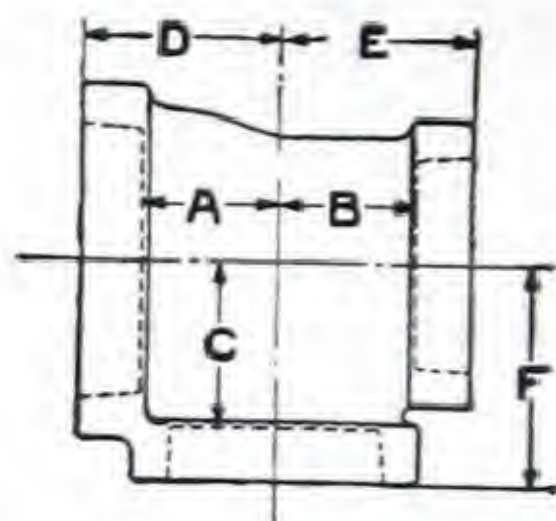


Fig. Nos. 358, 359

Dimensions A, B and C = End of Pipe
 Dimensions D, E and F = Face of Fitting

SIZE			DIMENSIONS					
			A	B	C	D	E	F
5	4	3	$2\frac{5}{16}$	$2\frac{7}{16}$	$3\frac{5}{16}$	$3\frac{1}{2}$	$3\frac{1}{2}$	$4\frac{5}{16}$
5	4	$2\frac{1}{2}$	2	$2\frac{1}{8}$	$3\frac{5}{16}$	$3\frac{3}{16}$	$3\frac{3}{16}$	$4\frac{1}{4}$
5	4	2	$1\frac{3}{4}$	$1\frac{5}{8}$	$3\frac{7}{16}$	$2\frac{15}{16}$	$2\frac{11}{16}$	$4\frac{1}{8}$
5	4	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{3}{8}$	$3\frac{3}{8}$	$2\frac{11}{16}$	$2\frac{7}{16}$	4
5	4	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{3}{8}$	$3\frac{3}{8}$	$2\frac{11}{16}$	$2\frac{7}{16}$	4
5	4	1	$1\frac{1}{2}$	$1\frac{3}{8}$	$3\frac{7}{16}$	$2\frac{11}{16}$	$2\frac{7}{16}$	4
5	$3\frac{1}{2}$	5	$3\frac{5}{16}$	$3\frac{3}{8}$	$3\frac{5}{16}$	$4\frac{1}{2}$	$4\frac{3}{8}$	$4\frac{1}{2}$
5	$3\frac{1}{2}$	4	$2\frac{13}{16}$	$2\frac{3}{4}$	$3\frac{5}{16}$	4	$3\frac{3}{4}$	$4\frac{3}{8}$
5	$3\frac{1}{2}$	$3\frac{1}{2}$	$2\frac{9}{16}$	$2\frac{1}{2}$	$3\frac{5}{16}$	$3\frac{3}{4}$	$3\frac{1}{2}$	$4\frac{5}{16}$
5	$3\frac{1}{2}$	3	$2\frac{5}{16}$	$2\frac{7}{16}$	$3\frac{5}{16}$	$3\frac{1}{2}$	$3\frac{1}{2}$	$4\frac{5}{16}$
5	3	5	$3\frac{5}{16}$	$3\frac{3}{16}$	$3\frac{5}{16}$	$4\frac{1}{2}$	$4\frac{5}{16}$	$4\frac{1}{2}$
5	3	4	$2\frac{13}{16}$	$2\frac{13}{16}$	$3\frac{5}{16}$	4	$3\frac{3}{4}$	$4\frac{3}{8}$
5	3	$3\frac{1}{2}$	$2\frac{9}{16}$	$2\frac{9}{16}$	$3\frac{5}{16}$	$3\frac{3}{4}$	$3\frac{1}{2}$	$4\frac{5}{16}$
5	3	3	$2\frac{5}{16}$	$2\frac{1}{2}$	$3\frac{5}{16}$	$3\frac{1}{2}$	$3\frac{1}{2}$	$4\frac{5}{16}$
5	$2\frac{1}{2}$	5	$3\frac{5}{16}$	$3\frac{5}{16}$	$3\frac{5}{16}$	$4\frac{1}{2}$	$4\frac{1}{4}$	$4\frac{1}{2}$
5	$2\frac{1}{2}$	4	$2\frac{13}{16}$	$2\frac{7}{8}$	$3\frac{5}{16}$	4	$3\frac{3}{4}$	$4\frac{3}{8}$
5	$2\frac{1}{2}$	$2\frac{1}{2}$	2	$2\frac{1}{4}$	$3\frac{5}{16}$	$3\frac{3}{16}$	$3\frac{3}{16}$	$4\frac{1}{4}$
5	2	5	$3\frac{5}{16}$	$3\frac{9}{16}$	$3\frac{5}{16}$	$4\frac{1}{2}$	$4\frac{1}{4}$	$4\frac{1}{2}$
5	2	4	$2\frac{13}{16}$	$3\frac{1}{16}$	$3\frac{5}{16}$	4	$3\frac{3}{4}$	$4\frac{3}{8}$
5	$1\frac{1}{2}$	5	$3\frac{5}{16}$	$3\frac{5}{8}$	$3\frac{5}{16}$	$4\frac{1}{2}$	$4\frac{1}{4}$	$4\frac{1}{2}$
5	$1\frac{1}{4}$	5	$3\frac{5}{16}$	$3\frac{5}{8}$	$3\frac{5}{16}$	$4\frac{1}{2}$	$4\frac{1}{4}$	$4\frac{1}{2}$
5	1	5	$3\frac{5}{16}$	$3\frac{11}{16}$	$3\frac{5}{16}$	$4\frac{1}{2}$	$4\frac{1}{4}$	$4\frac{1}{2}$
4	4	5	$3\frac{5}{16}$	$3\frac{13}{16}$	$2\frac{13}{16}$	$4\frac{3}{8}$	$4\frac{3}{8}$	4
4	$3\frac{1}{2}$	5	$3\frac{5}{16}$	$3\frac{5}{16}$	$2\frac{13}{16}$	$4\frac{3}{8}$	$4\frac{5}{16}$	4
4	3	5	$3\frac{5}{16}$	$3\frac{3}{8}$	$2\frac{13}{16}$	$4\frac{3}{8}$	$4\frac{5}{16}$	4
4	$2\frac{1}{2}$	5	$3\frac{5}{16}$	$3\frac{7}{16}$	$2\frac{13}{16}$	$4\frac{3}{8}$	$4\frac{5}{16}$	4
4	2	5	$3\frac{5}{16}$	$3\frac{5}{8}$	$2\frac{13}{16}$	$4\frac{3}{8}$	$4\frac{5}{16}$	4

DIMENSIONS

Cast Iron Tees (Continued)

125 Lbs. Steam Pressure

175 Lbs. Water Pressure

SIZE			DIMENSIONS					
			A	B	C	D	E	F
$3\frac{1}{2}$	$3\frac{1}{2}$	5	$3\frac{5}{16}$	$3\frac{5}{16}$	$2\frac{9}{16}$	$4\frac{5}{16}$	$4\frac{5}{16}$	$3\frac{3}{4}$
$3\frac{1}{2}$	3	5	$3\frac{5}{16}$	$3\frac{3}{8}$	$2\frac{9}{16}$	$4\frac{5}{16}$	$4\frac{5}{16}$	$3\frac{3}{4}$
3	3	5	$3\frac{3}{8}$	$3\frac{3}{8}$	$2\frac{9}{16}$	$4\frac{5}{16}$	$4\frac{5}{16}$	$3\frac{3}{4}$
6	6	6	$3\frac{7}{8}$	$3\frac{7}{8}$	$3\frac{7}{8}$	$5\frac{1}{8}$	$5\frac{1}{8}$	$5\frac{1}{8}$
6	6	5	$3\frac{3}{8}$	$3\frac{3}{8}$	$3\frac{13}{16}$	$4\frac{5}{8}$	$4\frac{5}{8}$	5
6	6	4	$2\frac{13}{16}$	$2\frac{13}{16}$	$3\frac{7}{8}$	$4\frac{1}{16}$	$4\frac{1}{16}$	$4\frac{15}{16}$
6	6	$3\frac{1}{2}$	$2\frac{13}{16}$	$2\frac{13}{16}$	$3\frac{7}{8}$	$4\frac{1}{16}$	$4\frac{1}{16}$	$4\frac{15}{16}$
6	6	3	$2\frac{5}{16}$	$2\frac{5}{16}$	$3\frac{7}{8}$	$3\frac{9}{16}$	$3\frac{9}{16}$	$4\frac{13}{16}$
6	6	$2\frac{1}{2}$	2	2	$3\frac{7}{8}$	$3\frac{1}{4}$	$3\frac{1}{4}$	$4\frac{3}{4}$
6	6	2	$1\frac{3}{4}$	$1\frac{3}{4}$	$3\frac{15}{16}$	3	3	$4\frac{5}{8}$
6	6	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$3\frac{7}{8}$	$2\frac{3}{4}$	$2\frac{3}{4}$	$4\frac{1}{2}$
6	6	$1\frac{1}{4}$	$1\frac{3}{8}$	$1\frac{3}{8}$	$3\frac{13}{16}$	$2\frac{5}{8}$	$2\frac{5}{8}$	$4\frac{7}{16}$
6	6	1	$1\frac{3}{8}$	$1\frac{3}{8}$	$3\frac{7}{8}$	$2\frac{5}{8}$	$2\frac{5}{8}$	$4\frac{7}{16}$
6	6	$\frac{3}{4}$	$1\frac{3}{8}$	$1\frac{3}{8}$	$3\frac{15}{16}$	$2\frac{5}{8}$	$2\frac{5}{8}$	$4\frac{7}{16}$
6	5	6	$3\frac{7}{8}$	$3\frac{15}{16}$	$3\frac{7}{8}$	$5\frac{1}{8}$	$5\frac{1}{8}$	$5\frac{1}{8}$
6	5	5	$3\frac{3}{8}$	$3\frac{5}{16}$	$3\frac{13}{16}$	$4\frac{5}{8}$	$4\frac{1}{2}$	5
6	5	4	$2\frac{13}{16}$	$2\frac{13}{16}$	$3\frac{7}{8}$	$4\frac{1}{16}$	4	$4\frac{15}{16}$
6	5	$3\frac{1}{2}$	$2\frac{9}{16}$	$2\frac{9}{16}$	$3\frac{13}{16}$	$3\frac{13}{16}$	$3\frac{3}{4}$	$4\frac{7}{8}$
6	5	3	$2\frac{5}{16}$	$2\frac{3}{8}$	$3\frac{7}{8}$	$3\frac{9}{16}$	$3\frac{9}{16}$	$4\frac{13}{16}$
6	5	$2\frac{1}{2}$	2	2	$3\frac{7}{8}$	$3\frac{1}{4}$	$3\frac{3}{16}$	$4\frac{3}{4}$
6	5	2	$1\frac{3}{4}$	$1\frac{3}{4}$	$3\frac{15}{16}$	3	$2\frac{15}{16}$	$4\frac{5}{8}$
6	5	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$3\frac{7}{8}$	$2\frac{3}{4}$	$2\frac{11}{16}$	$4\frac{1}{2}$
6	5	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$3\frac{7}{8}$	$2\frac{3}{4}$	$2\frac{11}{16}$	$4\frac{1}{2}$
6	4	6	$3\frac{7}{8}$	$3\frac{7}{8}$	$3\frac{7}{8}$	$5\frac{1}{8}$	$4\frac{15}{16}$	$5\frac{1}{8}$
6	4	5	$3\frac{3}{8}$	$3\frac{7}{16}$	$3\frac{13}{16}$	$4\frac{5}{8}$	$4\frac{1}{2}$	5
6	4	4	$2\frac{13}{16}$	$2\frac{15}{16}$	$3\frac{7}{8}$	$4\frac{1}{16}$	4	$4\frac{15}{16}$
6	4	3	$2\frac{5}{16}$	$2\frac{1}{2}$	$3\frac{7}{8}$	$3\frac{9}{16}$	$3\frac{9}{16}$	$4\frac{13}{16}$
6	4	$2\frac{1}{2}$	2	$2\frac{1}{8}$	$3\frac{7}{8}$	$3\frac{1}{4}$	$3\frac{3}{16}$	$4\frac{3}{4}$
6	4	2	$1\frac{3}{4}$	$1\frac{7}{8}$	$3\frac{15}{16}$	3	$2\frac{15}{16}$	$4\frac{5}{8}$
6	$3\frac{1}{2}$	6	$3\frac{7}{8}$	$3\frac{7}{8}$	$3\frac{7}{8}$	$5\frac{1}{8}$	$4\frac{15}{16}$	$5\frac{1}{8}$
6	$3\frac{1}{2}$	5	$3\frac{3}{8}$	$3\frac{1}{2}$	$3\frac{13}{16}$	$4\frac{5}{8}$	$4\frac{1}{2}$	5
6	$3\frac{1}{2}$	4	$2\frac{13}{16}$	$2\frac{15}{16}$	$3\frac{7}{8}$	$4\frac{1}{16}$	4	$4\frac{15}{16}$

DIMENSIONS Cast Iron Tees (Continued)

125 Lbs. Steam Pressure

175 Lbs. Water Pressure

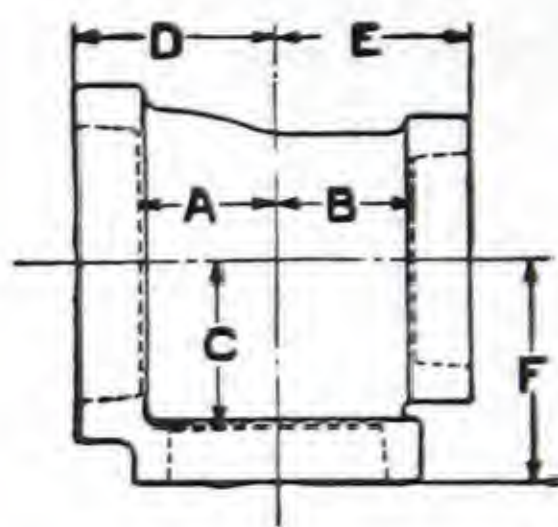


Fig. Nos. 358, 359

Dimensions A, B and C = End of Pipe
Dimensions D, E and F = Face of Fitting

SIZE			DIMENSIONS					
			A	B	C	D	E	F
6	3	6	$3\frac{7}{8}$	$3\frac{7}{8}$	$3\frac{7}{8}$	$5\frac{1}{8}$	$4\frac{13}{16}$	$5\frac{1}{8}$
6	3	5	$3\frac{3}{8}$	$3\frac{5}{16}$	$3\frac{13}{16}$	$4\frac{5}{8}$	$4\frac{5}{16}$	5
6	3	4	$2\frac{13}{16}$	3	$3\frac{7}{8}$	$4\frac{1}{16}$	4	$4\frac{15}{16}$
6	3	3	$2\frac{5}{16}$	$2\frac{5}{8}$	$3\frac{7}{8}$	$3\frac{9}{16}$	$3\frac{9}{16}$	$4\frac{13}{16}$
6	$2\frac{1}{2}$	6	$3\frac{7}{8}$	$3\frac{15}{16}$	$3\frac{7}{8}$	$5\frac{1}{8}$	$4\frac{13}{16}$	$5\frac{1}{8}$
6	2	6	$3\frac{7}{8}$	$4\frac{1}{8}$	$3\frac{7}{8}$	$5\frac{1}{8}$	$4\frac{13}{16}$	$5\frac{1}{8}$
6	$1\frac{1}{2}$	6	$3\frac{7}{8}$	$4\frac{3}{16}$	$3\frac{7}{8}$	$5\frac{1}{8}$	$4\frac{13}{16}$	$5\frac{1}{8}$
6	$1\frac{1}{4}$	6	$3\frac{7}{8}$	$4\frac{3}{16}$	$3\frac{7}{8}$	$5\frac{1}{8}$	$4\frac{13}{16}$	$5\frac{1}{8}$
6	1	6	$3\frac{7}{8}$	$4\frac{1}{4}$	$3\frac{7}{8}$	$5\frac{1}{8}$	$4\frac{13}{16}$	$5\frac{1}{8}$
5	5	6	$3\frac{13}{16}$	$3\frac{13}{16}$	$3\frac{3}{8}$	5	5	$4\frac{5}{8}$
5	4	6	$3\frac{13}{16}$	$3\frac{7}{8}$	$3\frac{3}{8}$	5	$4\frac{15}{16}$	$4\frac{5}{8}$
5	$3\frac{1}{2}$	6	$3\frac{13}{16}$	$3\frac{7}{8}$	$3\frac{3}{8}$	5	$4\frac{15}{16}$	$4\frac{5}{8}$
5	3	6	$3\frac{13}{16}$	$3\frac{15}{16}$	$3\frac{3}{8}$	5	$4\frac{15}{16}$	$4\frac{5}{8}$
4	4	6	$3\frac{7}{8}$	$3\frac{7}{8}$	$2\frac{13}{16}$	$4\frac{15}{16}$	$4\frac{15}{16}$	$4\frac{1}{16}$
4	$3\frac{1}{2}$	6	$3\frac{7}{8}$	$3\frac{7}{8}$	$2\frac{13}{16}$	$4\frac{15}{16}$	$4\frac{15}{16}$	$4\frac{1}{16}$
7	7	7	$4\frac{1}{2}$	$4\frac{1}{2}$	$4\frac{1}{2}$	$5\frac{13}{16}$	$5\frac{13}{16}$	$5\frac{13}{16}$
7	7	6	$4\frac{1}{2}$	$4\frac{1}{2}$	$4\frac{9}{16}$	$5\frac{13}{16}$	$5\frac{13}{16}$	$5\frac{13}{16}$
7	7	5	$4\frac{1}{2}$	$4\frac{1}{2}$	$4\frac{5}{8}$	$5\frac{13}{16}$	$5\frac{13}{16}$	$5\frac{13}{16}$
7	7	4	$2\frac{15}{16}$	$2\frac{15}{16}$	$4\frac{1}{2}$	$4\frac{1}{4}$	$4\frac{1}{4}$	$5\frac{1}{2}$
7	7	$3\frac{1}{2}$	$2\frac{15}{16}$	$2\frac{15}{16}$	$4\frac{1}{2}$	$4\frac{1}{4}$	$4\frac{1}{4}$	$5\frac{1}{2}$
7	7	3	$2\frac{15}{16}$	$2\frac{15}{16}$	$4\frac{9}{16}$	$4\frac{1}{4}$	$4\frac{1}{4}$	$5\frac{1}{2}$
7	7	$2\frac{1}{2}$	$2\frac{15}{16}$	$2\frac{15}{16}$	$4\frac{5}{8}$	$4\frac{1}{4}$	$4\frac{1}{4}$	$5\frac{1}{2}$
7	7	2	$2\frac{15}{16}$	$2\frac{15}{16}$	$4\frac{13}{16}$	$4\frac{1}{4}$	$4\frac{1}{4}$	$5\frac{1}{2}$
7	2	7	$4\frac{1}{2}$	$5\frac{1}{8}$	$4\frac{1}{2}$	$5\frac{13}{16}$	$5\frac{13}{16}$	$5\frac{13}{16}$

DIMENSIONS

Cast Iron Tees (Continued)

125 Lbs. Steam Pressure

175 Lbs. Water Pressure

SIZE			DIMENSIONS					
			A	B	C	D	E	F
8	8	8	$5\frac{3}{16}$	$5\frac{3}{16}$	$5\frac{3}{16}$	$6\frac{9}{16}$	$6\frac{9}{16}$	$6\frac{9}{16}$
8	8	7	$5\frac{3}{16}$	$5\frac{3}{16}$	$5\frac{1}{4}$	$6\frac{9}{16}$	$6\frac{9}{16}$	$6\frac{9}{16}$
8	8	6	$4\frac{3}{16}$	$4\frac{3}{16}$	$5\frac{1}{8}$	$5\frac{9}{16}$	$5\frac{9}{16}$	$6\frac{3}{8}$
8	8	5	$4\frac{3}{16}$	$4\frac{3}{16}$	$5\frac{3}{16}$	$5\frac{9}{16}$	$5\frac{9}{16}$	$6\frac{3}{8}$
8	8	4	$3\frac{1}{8}$	$3\frac{1}{8}$	$5\frac{1}{16}$	$4\frac{1}{2}$	$4\frac{1}{2}$	$6\frac{1}{8}$
8	8	$3\frac{1}{2}$	$3\frac{1}{8}$	$3\frac{1}{8}$	$5\frac{1}{8}$	$4\frac{1}{2}$	$4\frac{1}{2}$	$6\frac{1}{8}$
8	8	3	$3\frac{1}{8}$	$3\frac{1}{8}$	$5\frac{3}{16}$	$4\frac{1}{2}$	$4\frac{1}{2}$	$6\frac{1}{8}$
8	8	$2\frac{1}{2}$	$2\frac{5}{16}$	$2\frac{5}{16}$	$5\frac{1}{16}$	$3\frac{11}{16}$	$3\frac{11}{16}$	6
8	8	2	$2\frac{1}{16}$	$2\frac{1}{16}$	$5\frac{3}{16}$	$3\frac{7}{16}$	$3\frac{7}{16}$	$5\frac{7}{8}$
8	6	8	$5\frac{3}{16}$	$5\frac{5}{16}$	$5\frac{3}{16}$	$6\frac{9}{16}$	$6\frac{9}{16}$	$6\frac{9}{16}$
8	6	6	$4\frac{3}{16}$	$4\frac{5}{16}$	$5\frac{1}{8}$	$5\frac{9}{16}$	$5\frac{9}{16}$	$6\frac{3}{8}$
8	2	8	$5\frac{3}{16}$	$5\frac{7}{8}$	$5\frac{3}{16}$	$6\frac{9}{16}$	$6\frac{9}{16}$	$6\frac{9}{16}$
6	6	8	$5\frac{1}{8}$	$5\frac{1}{8}$	$4\frac{3}{16}$	$6\frac{3}{8}$	$6\frac{3}{8}$	$5\frac{9}{16}$
9	9	9	$5\frac{13}{16}$	$5\frac{13}{16}$	$5\frac{13}{16}$	$7\frac{1}{4}$	$7\frac{1}{4}$	$7\frac{1}{4}$
9	9	6	$4\frac{5}{16}$	$4\frac{5}{16}$	$5\frac{11}{16}$	$5\frac{3}{4}$	$5\frac{3}{4}$	$6\frac{15}{16}$
10	10	10	$6\frac{9}{16}$	$6\frac{9}{16}$	$6\frac{9}{16}$	$8\frac{1}{16}$	$8\frac{1}{16}$	$8\frac{1}{16}$
10	10	8	$6\frac{9}{16}$	$6\frac{9}{16}$	$6\frac{11}{16}$	$8\frac{1}{16}$	$8\frac{1}{16}$	$8\frac{1}{16}$
10	10	6	$4\frac{1}{2}$	$4\frac{1}{2}$	$6\frac{3}{8}$	6	6	$7\frac{5}{8}$
8	8	10	$6\frac{7}{16}$	$6\frac{7}{16}$	$5\frac{1}{2}$	$7\frac{13}{16}$	$7\frac{13}{16}$	7
12	12	12	$7\frac{3}{4}$	$7\frac{3}{4}$	$7\frac{3}{4}$	$9\frac{1}{2}$	$9\frac{1}{2}$	$9\frac{1}{2}$
12	12	8	$5\frac{11}{16}$	$5\frac{11}{16}$	$7\frac{11}{16}$	$7\frac{7}{16}$	$7\frac{7}{16}$	$9\frac{1}{16}$
14	14	14	$8\frac{7}{16}$	$8\frac{7}{16}$	$8\frac{7}{16}$	$10\frac{3}{8}$	$10\frac{3}{8}$	$10\frac{3}{8}$
16	16	16	$9\frac{5}{8}$	$9\frac{5}{8}$	$9\frac{5}{8}$	$11\frac{13}{16}$	$11\frac{13}{16}$	$11\frac{13}{16}$

DIMENSIONS Cast Iron Crosses

125 Lbs. Steam Pressure

175 Lbs. Water Pressure

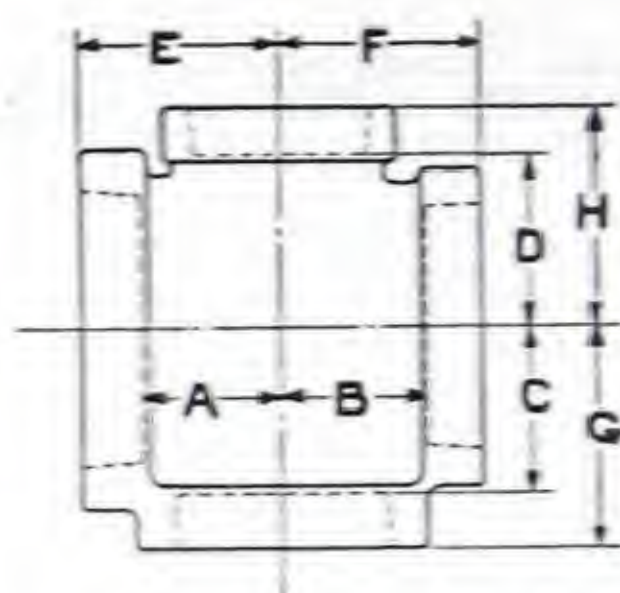


Fig. Nos. 360, 361

Dimensions A, B, C and D = End of Pipe
Dimensions E, F, G and H = Face of Fitting

SIZE				DIMENSIONS							
				A	B	C	D	E	F	G	H
$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{13}{16}$	$\frac{13}{16}$	$\frac{13}{16}$	$\frac{13}{16}$
$\frac{3}{8}$	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{5}{8}$	$\frac{5}{8}$	$\frac{5}{8}$	$\frac{5}{8}$	1	1	1	1
$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{11}{16}$	$\frac{11}{16}$	$\frac{11}{16}$	$\frac{11}{16}$	$1\frac{1}{8}$	$1\frac{1}{8}$	$1\frac{1}{8}$	$1\frac{1}{8}$
$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{13}{16}$	$\frac{13}{16}$	$\frac{13}{16}$	$\frac{13}{16}$	$1\frac{5}{16}$	$1\frac{5}{16}$	$1\frac{5}{16}$	$1\frac{5}{16}$
$\frac{3}{4}$	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{11}{16}$	$\frac{11}{16}$	$\frac{13}{16}$	$\frac{13}{16}$	$1\frac{3}{16}$	$1\frac{3}{16}$	$1\frac{1}{4}$	$1\frac{1}{4}$
$\frac{3}{4}$	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{1}{4}$	$\frac{11}{16}$	$\frac{11}{16}$	$\frac{13}{16}$	1	$1\frac{3}{16}$	$1\frac{3}{16}$	$1\frac{1}{4}$	$1\frac{1}{4}$
1	1	1	1	$\frac{15}{16}$	$\frac{15}{16}$	$\frac{15}{16}$	$\frac{15}{16}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$
1	1	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{13}{16}$	$\frac{13}{16}$	$\frac{15}{16}$	$\frac{15}{16}$	$1\frac{3}{8}$	$1\frac{3}{8}$	$1\frac{7}{16}$	$1\frac{7}{16}$
1	1	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{11}{16}$	$\frac{11}{16}$	$\frac{15}{16}$	$\frac{15}{16}$	$1\frac{1}{4}$	$1\frac{1}{4}$	$1\frac{3}{8}$	$1\frac{3}{8}$
1	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{13}{16}$	$\frac{7}{8}$	$\frac{15}{16}$	$\frac{15}{16}$	$1\frac{3}{8}$	$1\frac{3}{8}$	$1\frac{7}{16}$	$1\frac{7}{16}$
1	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{13}{16}$	$\frac{15}{16}$	$\frac{15}{16}$	$\frac{15}{16}$	$1\frac{3}{8}$	$1\frac{3}{8}$	$1\frac{7}{16}$	$1\frac{7}{16}$
$1\frac{1}{4}$	$1\frac{1}{4}$	$1\frac{1}{4}$	$1\frac{1}{4}$	$1\frac{1}{8}$	$1\frac{1}{8}$	$1\frac{1}{8}$	$1\frac{1}{8}$	$1\frac{3}{4}$	$1\frac{3}{4}$	$1\frac{3}{4}$	$1\frac{3}{4}$
$1\frac{1}{4}$	$1\frac{1}{4}$	1	1	$\frac{15}{16}$	$\frac{15}{16}$	$1\frac{1}{8}$	$1\frac{1}{8}$	$1\frac{9}{16}$	$1\frac{9}{16}$	$1\frac{11}{16}$	$1\frac{11}{16}$
$1\frac{1}{4}$	$1\frac{1}{4}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{13}{16}$	$\frac{13}{16}$	$1\frac{1}{8}$	$1\frac{1}{8}$	$1\frac{7}{16}$	$1\frac{7}{16}$	$1\frac{5}{8}$	$1\frac{5}{8}$
$1\frac{1}{4}$	$1\frac{1}{4}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{11}{16}$	$\frac{11}{16}$	$1\frac{1}{8}$	$1\frac{1}{8}$	$1\frac{5}{16}$	$1\frac{5}{16}$	$1\frac{9}{16}$	$1\frac{9}{16}$
$1\frac{1}{4}$	1	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{13}{16}$	$\frac{7}{8}$	$1\frac{1}{8}$	$1\frac{1}{8}$	$1\frac{7}{16}$	$1\frac{7}{16}$	$1\frac{5}{8}$	$1\frac{5}{8}$
$1\frac{1}{4}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{13}{16}$	$\frac{15}{16}$	$1\frac{1}{8}$	$1\frac{1}{8}$	$1\frac{7}{16}$	$1\frac{7}{16}$	$1\frac{5}{8}$	$1\frac{5}{8}$
$1\frac{1}{4}$	$\frac{1}{2}$	1	1	$\frac{15}{16}$	$\frac{15}{16}$	$1\frac{1}{8}$	$1\frac{1}{8}$	$1\frac{9}{16}$	$1\frac{9}{16}$	$1\frac{11}{16}$	$1\frac{11}{16}$
$1\frac{1}{4}$	$\frac{1}{2}$	1	$\frac{3}{4}$	$\frac{15}{16}$	$\frac{15}{16}$	$1\frac{1}{8}$	$1\frac{3}{16}$	$1\frac{9}{16}$	$1\frac{3}{8}$	$1\frac{11}{16}$	$1\frac{11}{16}$
$1\frac{1}{4}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{15}{16}$	$\frac{15}{16}$	$1\frac{3}{16}$	$1\frac{3}{16}$	$1\frac{9}{16}$	$1\frac{3}{8}$	$1\frac{11}{16}$	$1\frac{11}{16}$

DIMENSIONS

Cast Iron Crosses (Continued)

125 Lbs. Steam Pressure

175 Lbs. Water Pressure

SIZE				DIMENSIONS							
				A	B	C	D	E	F	G	H
1 1/2	1 1/2	1 1/2	1 1/2	1 5/16	1 5/16	1 5/16	1 5/16	1 15/16	1 15/16	1 15/16	1 15/16
1 1/2	1 1/2	1 1/4	1 1/4	1 3/16	1 3/16	1 1/4	1 1/4	1 13/16	1 13/16	1 7/8	1 7/8
1 1/2	1 1/2	1	1	1	1	1 1/4	1 1/4	1 5/8	1 5/8	1 13/16	1 13/16
1 1/2	1 1/2	3/4	3/4	7/8	7/8	1 1/4	1 1/4	1 1/2	1 1/2	1 3/4	1 3/4
1 1/2	1 1/2	1/2	1/2	13/16	13/16	1 1/4	1 1/4	1 7/16	1 7/16	1 11/16	1 11/16
1 1/2	1 1/4	1 1/2	1/2	1 5/16	1 1/4	1 5/16	1 1/4	1 15/16	1 7/8	1 15/16	1 11/16
1 1/2	1 1/4	1	1	1	1	1 1/4	1 1/4	1 5/8	1 5/8	1 13/16	1 13/16
1 1/2	1 1/4	3/4	3/4	7/8	7/8	1 1/4	1 1/4	1 1/2	1 1/2	1 3/4	1 3/4
1 1/2	1	3/4	3/4	7/8	15/16	1 1/4	1 1/4	1 1/2	1 1/2	1 3/4	1 3/4
1 1/2	3/4	1	3/4	1	1 1/8	1 1/4	1 5/16	1 5/8	1 5/8	1 13/16	1 13/16
1 1/2	1/2	1 1/4	1 1/4	1 3/16	1 1/8	1 1/4	1 1/4	1 13/16	1 9/16	1 7/8	1 7/8
1 1/2	1/2	1 1/4	1	1 3/16	1 1/8	1 1/4	1 5/16	1 13/16	1 9/16	1 7/8	1 7/8
1 1/2	1/2	1 1/4	3/4	1 3/16	1 1/8	1 1/4	1 3/8	1 13/16	1 9/16	1 7/8	1 7/8
1 1/2	1/2	1	1	1 3/16	1 1/8	1 5/16	1 5/16	1 13/16	1 9/16	1 7/8	1 7/8
1 1/2	1/2	1	3/4	1 3/16	1 1/8	1 5/16	1 3/8	1 13/16	1 9/16	1 7/8	1 7/8
2	2	2	2	1 9/16	1 9/16	1 9/16	1 9/16	2 1/4	2 1/4	2 1/4	2 1/4
2	2	1 1/2	1 1/2	1 5/16	1 5/16	1 1/2	1 1/2	2	2	2 1/8	2 1/8
2	2	1 1/4	1 1/4	1 3/16	1 3/16	1 7/16	1 7/16	1 7/8	1 7/8	2 1/16	2 1/16
2	2	1 1/4	3/4	1 3/16	1 3/16	1 7/16	1 9/16	1 7/8	1 7/8	2 1/16	2 1/16
2	2	1	1	1 1/16	1 1/16	1 7/16	1 7/16	1 3/4	1 3/4	2	2
2	2	1	3/4	1 1/16	1 1/16	1 7/16	1 1/2	1 3/4	1 3/4	2	2
2	2	3/4	3/4	7/8	7/8	1 7/16	1 7/16	1 9/16	1 9/16	1 15/16	1 15/16
2	2	1/2	1/2	13/16	13/16	1 7/16	1 7/16	1 1/2	1 1/2	1 7/8	1 7/8
2	1 1/2	1 1/2	1 1/2	1 5/16	1 3/8	1 1/2	1 1/2	2	2	2 1/8	2 1/8
2	1 1/2	1 1/2	3/4	1 5/16	1 3/8	1 1/2	1 5/8	2	2	2 1/8	2 1/8
2	1 1/2	1 1/4	1 1/4	1 3/16	1 1/4	1 7/16	1 7/16	1 7/8	1 7/8	2 1/16	2 1/16
2	1 1/2	1 1/4	1	1 3/16	1 1/4	1 7/16	1 1/2	1 7/8	1 7/8	2 1/16	2 1/16
2	1 1/2	1 1/4	3/4	1 3/16	1 1/4	1 7/16	1 9/16	1 7/8	1 7/8	2 1/16	2 1/16
2	1 1/2	1	1	1 1/16	1 1/8	1 7/16	1 7/16	1 3/4	1 3/4	2	2
2	1 1/2	1	3/4	1 1/16	1 1/8	1 7/16	1 1/2	1 3/4	1 3/4	2	2
2	1 1/2	3/4	3/4	7/8	15/16	1 7/16	1 7/16	1 9/16	1 9/16	1 15/16	1 15/16
2	1 1/4	1	3/4	1 1/16	1 1/8	1 7/16	1 1/2	1 3/4	1 3/4	2	2

DIMENSIONS

Cast Iron Crosses (Continued)

125 Lbs. Steam Pressure

175 Lbs. Water Pressure

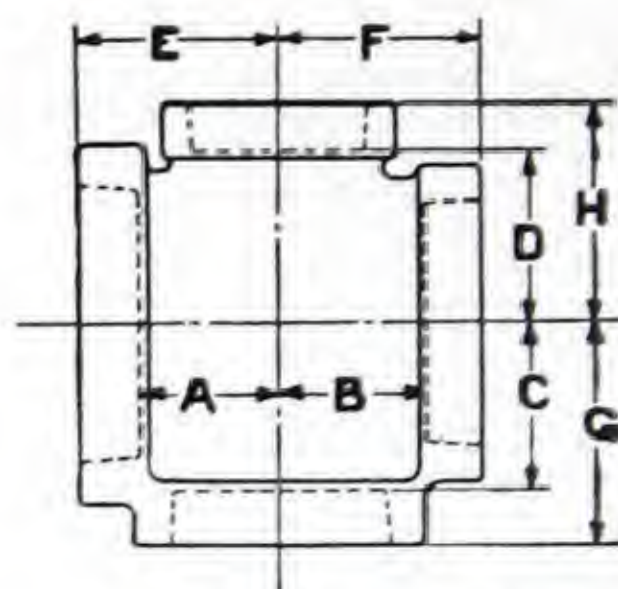


Fig. Nos. 360, 361

Dimensions A, B, C and D = End of Pipe
 Dimensions E, F, G and H = Face of Fitting

SIZE				DIMENSIONS							
				A	B	C	D	E	F	G	H
2	1	2	1	$1\frac{9}{16}$	$1\frac{11}{16}$	$1\frac{9}{16}$	$1\frac{11}{16}$	$2\frac{1}{4}$	$2\frac{1}{4}$	$2\frac{1}{4}$	$2\frac{1}{4}$
2	$\frac{3}{4}$	2	$1\frac{1}{2}$	$1\frac{9}{16}$	$1\frac{3}{4}$	$1\frac{9}{16}$	$1\frac{13}{16}$	$2\frac{1}{4}$	$2\frac{1}{4}$	$2\frac{1}{4}$	$2\frac{1}{4}$
2	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{5}{16}$	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{1}{2}$	2	$1\frac{11}{16}$	$2\frac{1}{8}$	$2\frac{1}{8}$
2	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{4}$	$1\frac{5}{16}$	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{7}{16}$	2	$1\frac{11}{16}$	$2\frac{1}{8}$	$2\frac{1}{16}$
2	$1\frac{1}{2}$	$1\frac{1}{2}$	1	$1\frac{5}{16}$	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{1}{2}$	2	$1\frac{11}{16}$	$2\frac{1}{8}$	$2\frac{1}{16}$
2	$1\frac{1}{2}$	$1\frac{1}{2}$	$\frac{3}{4}$	$1\frac{5}{16}$	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{9}{16}$	2	$1\frac{11}{16}$	$2\frac{1}{8}$	$2\frac{1}{16}$
2	$1\frac{1}{2}$	$1\frac{1}{4}$	$1\frac{1}{4}$	$1\frac{5}{16}$	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{7}{16}$	2	$1\frac{11}{16}$	$2\frac{1}{8}$	$2\frac{1}{16}$
2	$1\frac{1}{2}$	$1\frac{1}{4}$	1	$1\frac{5}{16}$	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{1}{2}$	2	$1\frac{11}{16}$	$2\frac{1}{8}$	$2\frac{1}{16}$
2	$1\frac{1}{2}$	$1\frac{1}{4}$	$\frac{3}{4}$	$1\frac{5}{16}$	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{9}{16}$	2	$1\frac{11}{16}$	$2\frac{1}{8}$	$2\frac{1}{16}$
$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{1}{2}$	$1\frac{13}{16}$	$1\frac{13}{16}$	$1\frac{13}{16}$	$1\frac{13}{16}$	$2\frac{11}{16}$	$2\frac{11}{16}$	$2\frac{11}{16}$	$2\frac{11}{16}$
$2\frac{1}{2}$	$2\frac{1}{2}$	2	2	$1\frac{9}{16}$	$1\frac{9}{16}$	$1\frac{7}{8}$	$1\frac{7}{8}$	$2\frac{7}{16}$	$2\frac{7}{16}$	$2\frac{9}{16}$	$2\frac{9}{16}$
$2\frac{1}{2}$	$2\frac{1}{2}$	2	$1\frac{1}{2}$	$1\frac{9}{16}$	$1\frac{9}{16}$	$1\frac{7}{8}$	$1\frac{15}{16}$	$2\frac{7}{16}$	$2\frac{7}{16}$	$2\frac{9}{16}$	$2\frac{9}{16}$
$2\frac{1}{2}$	$2\frac{1}{2}$	2	1	$1\frac{9}{16}$	$1\frac{9}{16}$	$1\frac{7}{8}$	2	$2\frac{7}{16}$	$2\frac{7}{16}$	$2\frac{9}{16}$	$2\frac{9}{16}$
$2\frac{1}{2}$	$2\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{5}{16}$	$1\frac{5}{16}$	$1\frac{13}{16}$	$1\frac{13}{16}$	$2\frac{3}{16}$	$2\frac{3}{16}$	$2\frac{7}{16}$	$2\frac{7}{16}$
$2\frac{1}{2}$	$2\frac{1}{2}$	$1\frac{1}{2}$	1	$1\frac{5}{16}$	$1\frac{5}{16}$	$1\frac{13}{16}$	$1\frac{7}{8}$	$2\frac{3}{16}$	$2\frac{3}{16}$	$2\frac{7}{16}$	$2\frac{7}{16}$
$2\frac{1}{2}$	$2\frac{1}{2}$	$1\frac{1}{2}$	$\frac{3}{4}$	$1\frac{5}{16}$	$1\frac{5}{16}$	$1\frac{13}{16}$	$1\frac{15}{16}$	$2\frac{3}{16}$	$2\frac{3}{16}$	$2\frac{7}{16}$	$2\frac{7}{16}$
$2\frac{1}{2}$	$2\frac{1}{2}$	$1\frac{1}{4}$	$1\frac{1}{4}$	$1\frac{3}{16}$	$1\frac{3}{16}$	$1\frac{3}{4}$	$1\frac{3}{4}$	$2\frac{1}{16}$	$2\frac{1}{16}$	$2\frac{3}{8}$	$2\frac{3}{8}$
$2\frac{1}{2}$	$2\frac{1}{2}$	$1\frac{1}{4}$	1	$1\frac{3}{16}$	$1\frac{3}{16}$	$1\frac{3}{4}$	$1\frac{13}{16}$	$2\frac{1}{16}$	$2\frac{1}{16}$	$2\frac{3}{8}$	$2\frac{3}{8}$
$2\frac{1}{2}$	$2\frac{1}{2}$	$1\frac{1}{4}$	$\frac{3}{4}$	$1\frac{3}{16}$	$1\frac{3}{16}$	$1\frac{3}{4}$	$1\frac{7}{8}$	$2\frac{1}{16}$	$2\frac{1}{16}$	$2\frac{3}{8}$	$2\frac{3}{8}$
$2\frac{1}{2}$	$2\frac{1}{2}$	1	1	1	1	$1\frac{3}{4}$	$1\frac{3}{4}$	$1\frac{15}{16}$	$1\frac{15}{16}$	$2\frac{5}{16}$	$2\frac{5}{16}$
$2\frac{1}{2}$	$2\frac{1}{2}$	1	$\frac{3}{4}$	1	1	$1\frac{3}{4}$	$1\frac{13}{16}$	$1\frac{15}{16}$	$1\frac{15}{16}$	$2\frac{5}{16}$	$2\frac{5}{16}$
$2\frac{1}{2}$	$2\frac{1}{2}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{7}{8}$	$\frac{7}{8}$	$1\frac{3}{4}$	$1\frac{3}{4}$	$1\frac{3}{4}$	$1\frac{3}{4}$	$2\frac{1}{4}$	$2\frac{1}{4}$
$2\frac{1}{2}$	$2\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$\frac{3}{4}$	$\frac{3}{4}$	$1\frac{3}{4}$	$1\frac{3}{4}$	$1\frac{11}{16}$	$1\frac{11}{16}$	$2\frac{3}{16}$	$2\frac{3}{16}$
$2\frac{1}{2}$	2	$2\frac{1}{2}$	2	$1\frac{13}{16}$	2	$1\frac{13}{16}$	2	$2\frac{11}{16}$	$2\frac{11}{16}$	$2\frac{11}{16}$	$2\frac{11}{16}$
$2\frac{1}{2}$	2	2	2	$1\frac{9}{16}$	$1\frac{3}{4}$	$1\frac{7}{8}$	$1\frac{7}{8}$	$2\frac{7}{16}$	$2\frac{7}{16}$	$2\frac{9}{16}$	$2\frac{9}{16}$

DIMENSIONS

Cast Iron Crosses (Continued)

125 Lbs. Steam Pressure

175 Lbs. Water Pressure

SIZE				DIMENSIONS							
				A	B	C	D	E	F	G	H
2 1/2	2	2	1 1/2	1 9/16	1 3/4	1 7/8	1 15/16	2 7/16	2 7/16	2 9/16	2 9/16
2 1/2	2	2	3/4	1 9/16	1 3/4	1 7/8	2 1/16	2 7/16	2 7/16	2 9/16	2 9/16
2 1/2	2	1 1/2	1 1/2	1 5/16	1 1/2	1 13/16	1 13/16	2 3/16	2 3/16	2 7/16	2 7/16
2 1/2	2	1 1/2	1 1/4	1 5/16	1 1/2	1 13/16	1 13/16	2 3/16	2 3/16	2 7/16	2 7/16
2 1/2	2	1 1/2	1	1 5/16	1 1/2	1 13/16	1 7/8	2 3/16	2 3/16	2 7/16	2 7/16
2 1/2	2	1 1/2	3/4	1 5/16	1 1/2	1 13/16	1 15/16	2 3/16	2 3/16	2 7/16	2 7/16
2 1/2	2	1 1/4	1 1/4	1 3/16	1 3/8	1 3/4	1 3/4	2 1/16	2 1/16	2 3/8	2 3/8
2 1/2	2	1 1/4	1	1 3/16	1 3/8	1 3/4	1 13/16	2 1/16	2 1/16	2 3/8	2 3/8
2 1/2	2	1 1/4	3/4	1 3/16	1 3/8	1 3/4	1 7/8	2 1/16	2 1/16	2 3/8	2 3/8
2 1/2	2	1	1	1	1 1/4	1 3/4	1 3/4	1 15/16	1 15/16	2 5/16	2 5/16
2 1/2	2	1	3/4	1	1 1/4	1 3/4	1 13/16	1 15/16	1 15/16	2 5/16	2 5/16
2 1/2	2	3/4	3/4	7/8	1 1/16	1 3/4	1 3/4	1 3/4	1 3/4	2 1/4	2 1/4
2 1/2	1/2	2	2	1 9/16	1 7/16	1 7/8	1 7/8	2 7/16	1 7/8	2 9/16	2 9/16
2 1/2	1/2	2	1 1/2	1 9/16	1 7/16	1 7/8	1 15/16	2 7/16	1 7/8	2 9/16	2 9/16
2 1/2	1/2	1 1/2	1 1/2	1 9/16	1 7/16	1 15/16	1 15/16	2 7/16	1 7/8	2 9/16	2 9/16
2 1/2	1/2	1 1/2	1 1/4	1 9/16	1 7/16	1 15/16	1 15/16	2 7/16	1 7/8	2 9/16	2 9/16
3	3	3	3	2 3/16	2 3/16	2 3/16	2 3/16	3 1/8	3 1/8	3 1/8	3 1/8
3	3	2 1/2	2 1/2	1 7/8	1 7/8	2 3/16	2 3/16	2 13/16	2 13/16	3 1/16	3 1/16
3	3	2	2	1 5/8	1 5/8	2 1/4	2 1/4	2 9/16	2 9/16	2 15/16	2 15/16
3	3	2	1 1/2	1 5/8	1 5/8	2 1/4	2 5/16	2 9/16	2 9/16	2 15/16	2 15/16
3	3	1 1/2	1 1/2	1 3/8	1 3/8	2 3/16	2 3/16	2 5/16	2 5/16	2 13/16	2 13/16
3	3	1 1/2	1 1/4	1 3/8	1 3/8	2 3/16	2 3/16	2 5/16	2 5/16	2 13/16	2 13/16
3	3	1 1/2	1	1 3/8	1 3/8	2 3/16	2 1/4	2 5/16	2 5/16	2 13/16	2 13/16
3	3	1 1/2	3/4	1 3/8	1 3/8	2 3/16	2 5/16	2 5/16	2 5/16	2 13/16	2 13/16
3	3	1 1/4	1 1/4	1 1/4	1 1/4	2 1/8	2 1/8	2 3/16	2 3/16	2 3/4	2 3/4
3	3	1 1/4	1	1 1/4	1 1/4	2 1/8	2 3/16	2 3/16	2 3/16	2 3/4	2 3/4
3	3	1 1/4	3/4	1 1/4	1 1/4	2 1/8	2 1/4	2 3/16	2 3/16	2 3/4	2 3/4
3	3	1	1	1 1/16	1 1/16	2 1/8	2 1/8	2 1/16	2 1/16	2 11/16	2 11/16
3	3	3/4	3/4	1 15/16	1 15/16	2 1/8	2 1/8	1 7/8	1 7/8	2 5/8	2 5/8
3	2 1/2	2 1/2	2	1 7/8	1 15/16	2 3/16	2 3/16	2 13/16	2 13/16	3 1/16	3 1/16
3	2 1/2	2	2	1 5/8	1 11/16	2 1/4	2 1/4	2 9/16	2 9/16	2 15/16	2 15/16
3	2 1/2	2	1 1/2	1 5/8	1 11/16	2 1/4	2 5/16	2 9/16	2 9/16	2 15/16	2 15/16

DIMENSIONS

Cast Iron Crosses (Continued)

125 Lbs. Steam Pressure

175 Lbs. Water Pressure

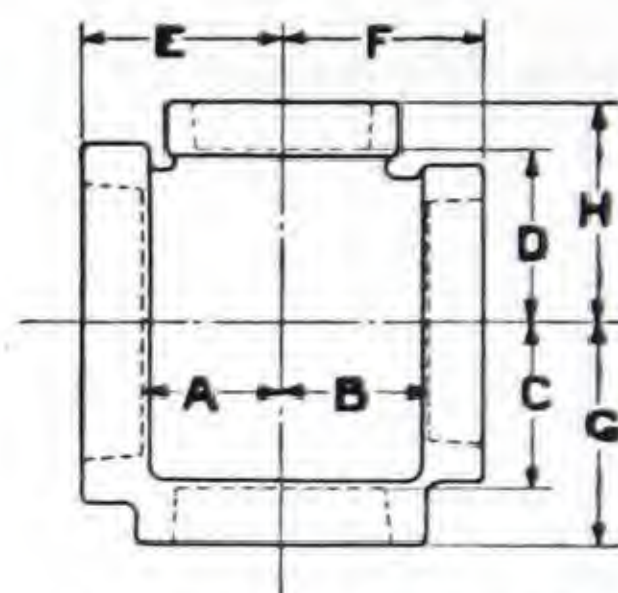


Fig. Nos. 360, 361

Dimensions A, B, C and D = End of Pipe
 Dimensions E, F, G and H = Face of Fitting

SIZE				DIMENSIONS							
				A	B	C	D	E	F	G	H
3	2 1/2	2	1 1/4	1 5/8	1 11/16	2 1/4	2 5/16	2 9/16	2 9/16	2 15/16	2 5/8
3	2 1/2	2	1	1 5/8	1 11/16	2 1/4	2 3/8	2 9/16	2 9/16	2 15/16	2 15/16
3	2 1/2	2	3/4	1 5/8	1 11/16	2 1/4	2 7/16	2 9/16	2 9/16	2 15/16	2 15/16
3	2 1/2	1 1/2	1 1/2	1 3/8	1 7/16	2 3/16	2 3/16	2 5/16	2 5/16	2 13/16	2 13/16
3	2 1/2	1 1/2	1 1/4	1 3/8	1 7/16	2 3/16	2 3/16	2 5/16	2 5/16	2 13/16	2 13/16
3	2 1/2	1 1/2	1	1 3/8	1 7/16	2 3/16	2 1/4	2 5/16	2 5/16	2 13/16	2 13/16
3	2 1/2	1 1/2	3/4	1 3/8	1 7/16	2 3/16	2 5/16	2 5/16	2 5/16	2 13/16	2 13/16
3	2 1/2	1 1/4	1 1/4	1 1/4	1 5/16	2 1/8	2 1/8	2 3/16	2 3/16	2 3/4	2 3/4
3	2 1/2	1 1/4	1	1 1/4	1 5/16	2 1/8	2 3/16	2 3/16	2 3/16	2 3/4	2 3/4
3	2 1/2	1 1/4	3/4	1 1/4	1 5/16	2 1/8	2 1/4	2 3/16	2 3/16	2 3/4	2 3/4
3	2 1/2	1	1	1 1/16	1 1/8	2 1/8	2 1/8	2 1/16	2 1/16	2 11/16	2 11/16
3	2	2	1 1/2	1 5/8	1 7/8	2 1/4	2 5/16	2 9/16	2 9/16	2 15/16	2 15/16
3 1/2	3 1/2	3 1/2	3 1/2	2 7/16	2 7/16	2 7/16	2 7/16	3 7/16	3 7/16	3 7/16	3 7/16
3 1/2	3 1/2	3	3	2 3/16	2 3/16	2 7/16	2 7/16	3 3/16	3 3/16	3 3/8	3 3/8
3 1/2	3 1/2	2 1/2	2 1/2	1 7/8	1 7/8	2 7/16	2 7/16	2 7/8	2 7/8	3 5/16	3 5/16
3 1/2	3 1/2	2	2	1 5/8	1 5/8	2 1/2	2 1/2	2 5/8	2 5/8	3 3/16	3 3/16
3 1/2	3 1/2	2	1 1/2	1 5/8	1 5/8	2 1/2	2 9/16	2 5/8	2 5/8	3 3/16	3 3/16
3 1/2	3 1/2	1 1/2	1 1/2	1 3/8	1 3/8	2 7/16	2 7/16	2 3/8	2 3/8	3 1/16	3 1/16
3 1/2	3 1/2	1 1/2	1	1 3/8	1 3/8	2 7/16	2 1/2	2 3/8	2 3/8	3 1/16	3 1/16
3 1/2	3 1/2	1 1/2	3/4	1 3/8	1 3/8	2 7/16	2 9/16	2 3/8	2 3/8	3 1/16	3 1/16
3 1/2	3 1/2	1 1/4	1 1/4	1 1/4	1 1/4	2 3/8	2 3/8	2 1/4	2 1/4	3	3
3 1/2	3 1/2	1 1/4	3/4	1 1/4	1 1/4	2 3/8	2 1/2	2 1/4	2 1/4	3	3
3 1/2	3 1/2	1	1	1 1/4	1 1/4	2 7/16	2 7/16	2 1/4	2 1/4	3	3
3 1/2	3	2 1/2	2 1/2	1 7/8	1 15/16	2 7/16	2 7/16	2 7/8	2 7/8	3 5/16	3 5/16
3 1/2	3	2 1/2	1 1/2	1 7/8	1 15/16	2 7/16	2 11/16	2 7/8	2 7/8	3 5/16	3 5/16

DIMENSIONS

Cast Iron Crosses (Continued)

125 Lbs. Steam Pressure

175 Lbs. Water Pressure

SIZE				DIMENSIONS							
				A	B	C	D	E	F	G	H
3 1/2	3	2	2	1 5/8	1 11/16	2 1/2	2 1/2	2 5/8	2 5/8	3 3/16	3 3/16
3 1/2	3	2	1 1/2	1 5/8	1 11/16	2 1/2	2 9/16	2 5/8	2 5/8	3 3/16	3 3/16
3 1/2	3	1 1/2	1 1/2	1 3/8	1 7/16	2 7/16	2 7/16	2 3/8	2 3/8	3 1/16	3 1/16
3 1/2	3	1 1/2	1 1/4	1 3/8	1 7/16	2 7/16	2 7/16	2 3/8	2 3/8	3 1/16	3 1/16
3 1/2	3	1 1/2	1	1 3/8	1 7/16	2 7/16	2 1/2	2 3/8	2 3/8	3 1/16	3 1/16
3 1/2	3	1 1/2	3/4	1 3/8	1 7/16	2 7/16	2 9/16	2 3/8	2 3/8	3 1/16	3 1/16
3 1/2	3	1 1/4	1 1/4	1 1/4	1 5/16	2 3/8	2 3/8	2 1/4	2 1/4	3	3
3 1/2	3	1	1	1 1/4	1 5/16	2 7/16	2 7/16	2 1/4	2 1/4	3	3
4	4	4	4	2 11/16	2 11/16	2 11/16	2 11/16	3 3/4	3 3/4	3 3/4	3 3/4
4	4	3 1/2	3 1/2	2 11/16	2 11/16	2 3/4	2 3/4	3 3/4	3 3/4	3 3/4	3 3/4
4	4	3	3	2 3/16	2 3/16	2 11/16	2 11/16	3 1/4	3 1/4	3 5/8	3 5/8
4	4	2 1/2	2 1/2	1 7/8	1 7/8	2 11/16	2 11/16	2 15/16	2 15/16	3 9/16	3 9/16
4	4	2	2	1 5/8	1 5/8	2 13/16	2 13/16	2 11/16	2 11/16	3 1/2	3 1/2
4	4	2	1	1 5/8	1 5/8	2 13/16	2 15/16	2 11/16	2 11/16	3 1/2	3 1/2
4	4	1 1/2	1 1/2	1 3/8	1 3/8	2 11/16	2 11/16	2 7/16	2 7/16	3 5/16	3 5/16
4	4	1 1/2	1	1 3/8	1 3/8	2 11/16	2 3/4	2 7/16	2 7/16	3 5/16	3 5/16
4	4	1 1/4	1 1/4	1 1/4	1 1/4	2 11/16	2 11/16	2 5/16	2 5/16	3 5/16	3 5/16
4	4	1 1/4	3/4	1 1/4	1 1/4	2 11/16	2 13/16	2 5/16	2 5/16	3 5/16	3 5/16
4	3 1/2	2 1/2	2 1/2	1 7/8	1 15/16	2 11/16	2 11/16	2 15/16	2 15/16	3 9/16	3 9/16
4	3 1/2	2 1/2	1	1 7/8	1 15/16	2 11/16	3	2 15/16	2 15/16	3 9/16	3 9/16
4	3 1/2	2	2	1 5/8	1 11/16	2 13/16	2 13/16	2 11/16	2 11/16	3 1/2	3 1/2
4	3 1/2	2	1	1 5/8	1 11/16	2 13/16	2 15/16	2 11/16	2 11/16	3 1/2	3 1/2
4	3 1/2	1 1/2	1 1/2	1 3/8	1 7/16	2 11/16	2 11/16	2 7/16	2 7/16	3 5/16	3 5/16
4	3 1/2	1 1/2	1	1 3/8	1 7/16	2 11/16	2 3/4	2 7/16	2 7/16	3 5/16	3 5/16
4	3 1/2	1 1/4	1 1/4	1 1/4	1 5/16	2 11/16	2 11/16	2 5/16	2 5/16	3 5/16	3 5/16
4	3	2 1/2	2	1 7/8	2	2 11/16	2 7/8	2 15/16	2 15/16	3 9/16	3 9/16
5	5	5	5	3 5/16	3 5/16	3 5/16	3 5/16	4 1/2	4 1/2	4 1/2	4 1/2
5	5	4	4	2 13/16	2 13/16	3 5/16	3 5/16	4	4	4 3/8	4 3/8
5	5	3 1/2	3 1/2	2 13/16	2 13/16	3 3/8	3 3/8	4	4	4 3/8	4 3/8
5	5	3	3	2 5/16	2 5/16	3 5/16	3 5/16	3 1/2	3 1/2	4 5/16	4 5/16
5	5	2 1/2	2 1/2	2	2	3 5/16	3 5/16	3 3/16	3 3/16	4 1/4	4 1/4
5	5	2	2	1 3/4	1 3/4	3 7/16	3 7/16	2 15/16	2 15/16	4 1/8	4 1/8

DIMENSIONS

Cast Iron Crosses (Continued)

125 Lbs. Steam Pressure

175 Lbs. Water Pressure

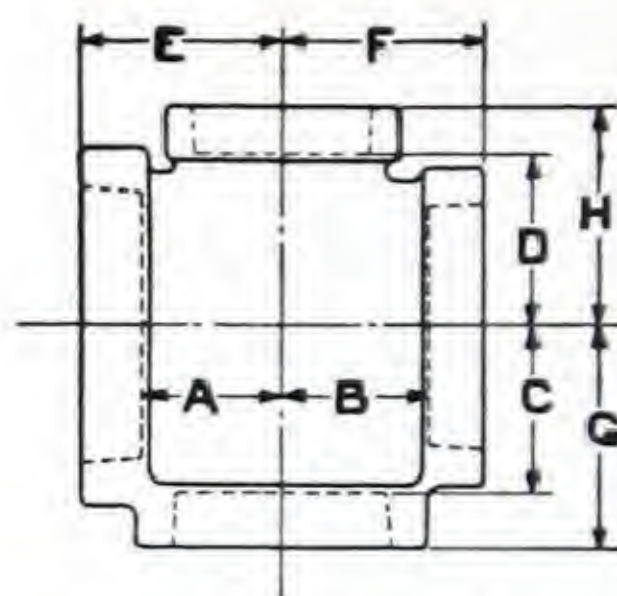


Fig. Nos. 360, 361

Dimensions A, B, C and D = End of Pipe
 Dimensions E, F, G and H = Face of Fitting

SIZE				DIMENSIONS							
				A	B	C	D	E	F	G	H
5	5	2	1 1/2	1 3/4	1 3/4	3 7/16	3 1/2	2 15/16	2 15/16	4 1/8	4 1/8
5	5	1 1/2	1 1/2	1 1/2	1 1/2	3 3/8	3 3/8	2 11/16	2 11/16	4	4
5	5	1 1/2	3/4	1 1/2	1 1/2	3 3/8	3 1/2	2 11/16	2 11/16	4	4
5	5	1 1/4	1 1/4	1 3/8	1 3/8	3 5/16	3 5/16	2 9/16	2 9/16	3 15/16	3 15/16
5	5	1 1/4	3/4	1 3/8	1 3/8	3 5/16	3 7/16	2 9/16	2 9/16	3 15/16	3 15/16
5	4	2 1/2	2 1/2	2	2 1/8	3 5/16	3 5/16	3 3/16	3 3/16	4 1/4	4 1/4
5	4	2 1/2	2	2	2 1/8	3 5/16	3 9/16	3 3/16	3 3/16	4 1/4	4 1/4
5	4	2	2	1 3/4	1 7/8	3 7/16	3 7/16	2 15/16	2 15/16	4 1/8	4 1/8
5	4	2	1 1/2	1 3/4	1 7/8	3 7/16	3 1/2	2 15/16	2 15/16	4 1/8	4 1/8
5	4	1 1/2	1 1/2	1 1/2	1 5/8	3 3/8	3 3/8	2 11/16	2 11/16	4	4
6	6	6	6	3 7/8	3 7/8	3 7/8	3 7/8	5 1/8	5 1/8	5 1/8	5 1/8
6	6	5	5	3 3/8	3 3/8	3 13/16	3 13/16	4 5/8	4 5/8	5	5
6	6	4	4	2 13/16	2 13/16	3 7/8	3 7/8	4 1/16	4 1/16	4 15/16	4 15/16
6	6	3 1/2	3 1/2	2 13/16	2 13/16	3 7/8	3 7/8	4 1/16	4 1/16	4 15/16	4 15/16
6	6	3	3	2 5/16	2 5/16	3 7/8	3 7/8	3 9/16	3 9/16	4 13/16	4 13/16
6	6	2 1/2	2 1/2	2	2	3 7/8	3 7/8	3 1/4	3 1/4	4 3/4	4 3/4
6	6	2	2	1 3/4	1 3/4	3 13/16	3 15/16	3	3	4 5/8	4 5/8
6	6	1 1/2	1 1/2	1 1/2	1 1/2	3 7/8	3 7/8	2 3/4	2 3/4	4 1/2	4 1/2
6	6	1 1/2	3/4	1 1/2	1 1/2	3 7/8	4	2 3/4	2 3/4	4 1/2	4 1/2
6	6	1 1/4	1 1/4	1 3/8	1 3/8	3 13/16	3 13/16	2 5/8	2 5/8	4 7/16	4 7/16
6	5	3	3	2 5/16	2 3/8	3 7/8	3 7/8	3 9/16	3 9/16	4 13/16	4 13/16

DIMENSIONS

Cast Iron Crosses (Continued)

125 Lbs. Steam Pressure

175 Lbs. Water Pressure

SIZE				DIMENSIONS							
				A	B	C	D	E	F	G	H
7	7	7	7	$4\frac{1}{2}$	$4\frac{1}{2}$	$4\frac{1}{2}$	$4\frac{1}{2}$	$5\frac{13}{16}$	$5\frac{13}{16}$	$5\frac{13}{16}$	$5\frac{13}{16}$
7	7	4	4	$2\frac{15}{16}$	$2\frac{15}{16}$	$4\frac{1}{2}$	$4\frac{1}{2}$	$4\frac{1}{4}$	$4\frac{1}{4}$	$5\frac{1}{2}$	$5\frac{1}{2}$
8	8	8	8	$5\frac{3}{16}$	$5\frac{3}{16}$	$5\frac{3}{16}$	$5\frac{3}{16}$	$6\frac{9}{16}$	$6\frac{9}{16}$	$6\frac{9}{16}$	$6\frac{9}{16}$
8	8	6	6	$4\frac{3}{16}$	$4\frac{3}{16}$	$5\frac{1}{8}$	$5\frac{1}{8}$	$5\frac{9}{16}$	$5\frac{9}{16}$	$6\frac{3}{8}$	$6\frac{3}{8}$
8	8	4	4	$3\frac{1}{8}$	$3\frac{1}{8}$	$5\frac{1}{16}$	$5\frac{1}{16}$	$4\frac{1}{2}$	$4\frac{1}{2}$	$6\frac{1}{8}$	$6\frac{1}{8}$
10	10	10	10	$6\frac{9}{16}$	$6\frac{9}{16}$	$6\frac{9}{16}$	$6\frac{9}{16}$	$8\frac{1}{16}$	$8\frac{1}{16}$	$8\frac{1}{16}$	$8\frac{1}{16}$
10	10	6	6	$4\frac{1}{2}$	$4\frac{1}{2}$	$6\frac{3}{8}$	$6\frac{3}{8}$	6	6	$7\frac{5}{8}$	$7\frac{5}{8}$
12	12	12	12	$7\frac{3}{4}$	$7\frac{3}{4}$	$7\frac{3}{4}$	$7\frac{3}{4}$	$9\frac{1}{2}$	$9\frac{1}{2}$	$9\frac{1}{2}$	$9\frac{1}{2}$
12	12	8	8	$5\frac{11}{16}$	$5\frac{11}{16}$	$7\frac{11}{16}$	$7\frac{11}{16}$	$7\frac{7}{16}$	$7\frac{7}{16}$	$9\frac{1}{16}$	$9\frac{1}{16}$

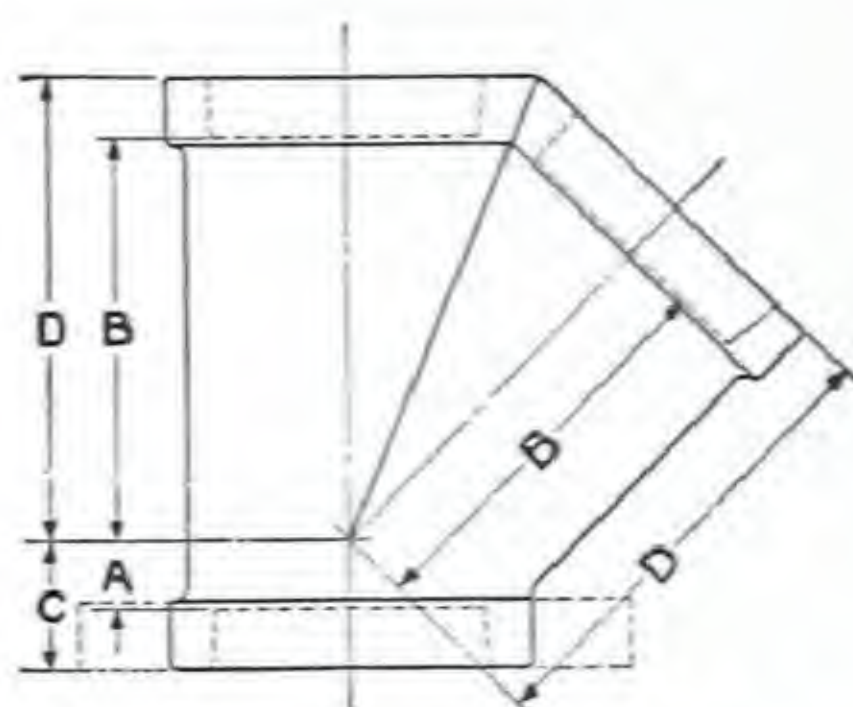


DIMENSIONS

Cast Iron Y's (Laterals)

125 Lbs. Steam Pressure

175 Lbs. Water Pressure



C. I. Y's, Fig. Nos. 373, 374

Reducing sizes are made to order from straight size patterns.

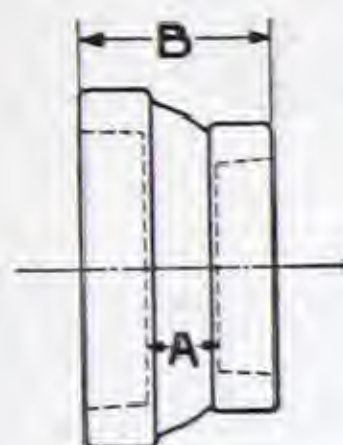
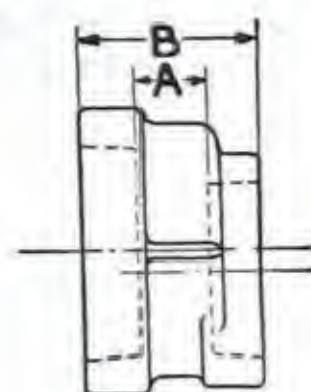
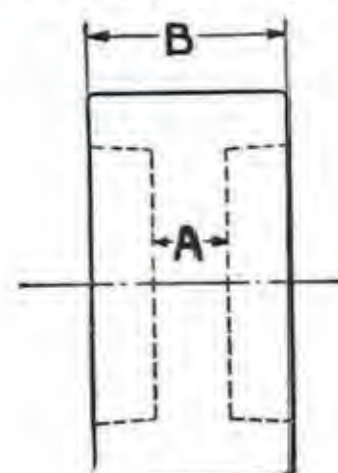
Dimensions A and B indicate end of pipe.

Dimension C is same for screw or flanged ends.

SIZE			DIMENSIONS			
			A	B	C	D
$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{16}$	$1\frac{7}{16}$	$\frac{5}{8}$	$1\frac{7}{8}$
$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{1}{4}$	$1\frac{3}{4}$	$\frac{3}{4}$	$2\frac{1}{4}$
1	1	1	$\frac{3}{16}$	$2\frac{3}{16}$	$\frac{3}{4}$	$2\frac{3}{4}$
$1\frac{1}{4}$	$1\frac{1}{4}$	$1\frac{1}{4}$	$\frac{3}{8}$	$2\frac{5}{8}$	1	$3\frac{1}{4}$
$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$\frac{7}{16}$	$3\frac{3}{16}$	$1\frac{1}{16}$	$3\frac{13}{16}$
2	2	2	$\frac{9}{16}$	$3\frac{13}{16}$	$1\frac{1}{4}$	$4\frac{1}{2}$
$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{1}{2}$	$\frac{5}{8}$	$4\frac{5}{16}$	$1\frac{1}{2}$	$5\frac{3}{16}$
3	3	3	$\frac{13}{16}$	$5\frac{3}{16}$	$1\frac{3}{4}$	$6\frac{1}{8}$
$3\frac{1}{2}$	$3\frac{1}{2}$	$3\frac{1}{2}$	1	$5\frac{7}{8}$	2	$6\frac{7}{8}$
4	4	4	$1\frac{1}{16}$	$6\frac{9}{16}$	$2\frac{1}{8}$	$7\frac{5}{8}$
5	5	5	$1\frac{3}{16}$	$8\frac{1}{16}$	$2\frac{3}{8}$	$9\frac{1}{4}$
6	6	6	$1\frac{7}{16}$	$9\frac{1}{2}$	$2\frac{11}{16}$	$10\frac{3}{4}$
8	8	8	$1\frac{15}{16}$	$12\frac{1}{4}$	$3\frac{5}{16}$	$13\frac{5}{8}$

DIMENSIONS

C. I. Reducers—C. I. Eccentric Reducers—C. I. Couplings

Reducer
Fig. No. 367Eccentric Reducer
Fig. No. 368Coupling
Fig. No. 369

A = End to End of Pipe

B = Face of Fitting

REDUCER			ECCENTRIC REDUCER			COUPLING		
SIZE	A	B	SIZE	A	B	SIZE	A	B
$\frac{3}{4} \times \frac{1}{2}$	$\frac{5}{8}$	$1 \frac{9}{16}$	$1 \frac{1}{4} \times 1$	$\frac{1}{2}$	$1 \frac{11}{16}$	$1 \frac{1}{4}$	$\frac{13}{16}$	$2 \frac{1}{16}$
$1 \times \frac{1}{2}$	$\frac{11}{16}$	$1 \frac{11}{16}$	$1 \frac{1}{2} \times 1 \frac{1}{4}$	$\frac{5}{8}$	$1 \frac{7}{8}$	$1 \frac{1}{2}$	$1 \frac{1}{16}$	$2 \frac{5}{16}$
$2 \frac{1}{2} \times 2$	1	$2 \frac{9}{16}$	$1 \frac{1}{2} \times 1$	$\frac{9}{16}$	$1 \frac{3}{4}$	2	$1 \frac{1}{8}$	$2 \frac{1}{2}$
$2 \frac{1}{2} \times 1 \frac{1}{2}$	$\frac{7}{8}$	$2 \frac{3}{8}$	$2 \times 1 \frac{1}{2}$	$\frac{7}{8}$	$2 \frac{3}{16}$	$2 \frac{1}{2}$	$1 \frac{1}{4}$	3
$2 \frac{1}{2} \times 1$	$\frac{13}{16}$	$2 \frac{1}{4}$	$2 \times 1 \frac{1}{4}$	$\frac{13}{16}$	$2 \frac{1}{8}$			
			2×1	$\frac{3}{4}$	2	3	$1 \frac{1}{2}$	$3 \frac{1}{4}$
$3 \times 2 \frac{1}{2}$	$\frac{15}{16}$	$2 \frac{13}{16}$	$2 \frac{1}{2} \times 2$	1	$2 \frac{9}{16}$	$3 \frac{1}{2}$	$1 \frac{3}{8}$	$3 \frac{1}{4}$
3×2	$1 \frac{1}{16}$	$2 \frac{3}{4}$	$2 \frac{1}{2} \times 1 \frac{1}{2}$	$\frac{7}{8}$	$2 \frac{3}{8}$			
$3 \times 1 \frac{1}{2}$	$\frac{15}{16}$	$2 \frac{9}{16}$	$2 \frac{1}{2} \times 1 \frac{1}{4}$	$\frac{13}{16}$	$2 \frac{5}{16}$	4	$1 \frac{1}{4}$	$3 \frac{1}{4}$
$3 \frac{1}{2} \times 3$	$\frac{15}{16}$	$2 \frac{15}{16}$				5	$1 \frac{3}{8}$	$3 \frac{1}{2}$
$4 \times 3 \frac{1}{2}$	$1 \frac{1}{8}$	$3 \frac{3}{16}$	$3 \times 2 \frac{1}{2}$	$\frac{15}{16}$	$2 \frac{13}{16}$	6	$1 \frac{3}{4}$	4
4×3	$1 \frac{1}{16}$	$3 \frac{1}{8}$	3×2	$1 \frac{1}{16}$	$2 \frac{3}{4}$	...	...	...
$4 \times 2 \frac{1}{2}$	$1 \frac{3}{16}$	$3 \frac{1}{8}$	$3 \times 1 \frac{1}{2}$	1	$2 \frac{5}{8}$	...	...	...
4×2	$1 \frac{3}{16}$	$2 \frac{15}{16}$				...	...	...
$4 \frac{1}{2} \times 4$	$1 \frac{1}{16}$	$3 \frac{1}{4}$	$3 \frac{1}{2} \times 3$	$\frac{15}{16}$	$2 \frac{15}{16}$	...	...	...
			$3 \frac{1}{2} \times 2 \frac{1}{2}$	1	$2 \frac{7}{8}$	...	...	...
$5 \times 4 \frac{1}{2}$	$1 \frac{1}{16}$	$3 \frac{3}{8}$	$3 \frac{1}{2} \times 2$	$1 \frac{1}{16}$	$2 \frac{3}{4}$	...	...	...
5×4	$1 \frac{1}{16}$	$3 \frac{5}{16}$				...	...	...
$5 \times 3 \frac{1}{2}$	$1 \frac{1}{8}$	$3 \frac{5}{16}$	$4 \times 3 \frac{1}{2}$	$1 \frac{1}{8}$	$3 \frac{3}{16}$	...	...	...
5×3	$1 \frac{1}{16}$	$3 \frac{1}{4}$	4×3	$1 \frac{1}{16}$	$3 \frac{1}{8}$	...	...	...
			$4 \times 2 \frac{1}{2}$	$1 \frac{1}{8}$	$3 \frac{1}{16}$	...	...	...
6×5	$1 \frac{1}{8}$	$3 \frac{9}{16}$	4×2	$1 \frac{3}{16}$	$2 \frac{15}{16}$	...	...	...
6×4	$1 \frac{1}{8}$	$3 \frac{7}{16}$				...	...	...
6×3	$1 \frac{1}{16}$	$3 \frac{5}{16}$	$4 \frac{1}{2} \times 4$	$1 \frac{1}{16}$	$3 \frac{1}{4}$	...	...	...
					
8×6	$1 \frac{1}{4}$	$3 \frac{7}{8}$	$5 \times 4 \frac{1}{2}$	$1 \frac{1}{16}$	$3 \frac{3}{8}$	...	...	...
8×4	$1 \frac{3}{16}$	$3 \frac{5}{8}$	5×4	$1 \frac{1}{16}$	$3 \frac{5}{16}$	...	...	...
			$5 \times 3 \frac{1}{2}$	$1 \frac{1}{16}$	$3 \frac{1}{4}$	...	...	...
10×8	$1 \frac{7}{16}$	$4 \frac{5}{16}$	5×3	$1 \frac{1}{16}$	$3 \frac{1}{4}$	...	...	...
					
			6×5	$1 \frac{1}{8}$	$3 \frac{9}{16}$	...	...	...
			6×4	$1 \frac{1}{8}$	$3 \frac{7}{16}$	...	...	...
			$6 \times 3 \frac{1}{2}$	$1 \frac{1}{8}$	$3 \frac{3}{8}$	...	...	...
					
			7×6	$1 \frac{3}{16}$	$3 \frac{3}{4}$	...	...	...
					
			8×7	$1 \frac{1}{4}$	$3 \frac{15}{16}$	...	...	...
			8×6	$1 \frac{1}{4}$	$3 \frac{7}{8}$	...	...	...
			8×5	$1 \frac{3}{16}$	$3 \frac{3}{4}$	...	...	...

GRINNELL CAST IRON FITTINGS

Branch Tees

Four types of Grinnell Cast Iron Branch Tees are shown on opposite page together with Names and Figure Numbers for each type; also List Prices.

Note that End Back, Back or Side Outlets will be charged as additional Front Outlets or Branches.

Sizes not covered by list prices on opposite page will be charged at special net prices.

Dimension tables on pages 94 to 97 inclusive.

All outlets are tapped Right Hand. Left Hand tappings on Branches or on End, End Back, Back or Side Outlets can be furnished on order.

The Back Outlet on Figure Number 393 and the Side Outlet on Figure Number 394 are in the center of the length of the Tees.

All Branch Tees will be shipped with both ends open unless otherwise specified.

INSTRUCTIONS FOR ORDERING

To order Branch Tees, specify size of tappings on run or ends, size of tappings on branches, number of branches and Figure Number, as :

(Quantity) Branch Tees, $1\frac{1}{2}$ x $1\frac{1}{4}$ x 6 branch, Fig. No. 391.

To order Branch Tees with End Back, Back or Side Outlets, specify also size of such outlet, as :

(Quantity) Branch Tees, $1\frac{1}{2}$ x $1\frac{1}{4}$ x 6 branch, $1\frac{1}{2}$ Back Outlet, Fig. No. 393.

GRINNELL CAST IRON FITTINGS

Branch Tees

125 Lbs. Steam Pressure



Both Ends (B. E.)
Fig. No. 391



End Back Outlet (E. B. O.)
Fig. No. 392



Back Outlet (B. O.)
Fig. No. 393



Side Outlet (S. O.)
Fig. No. 394

All ends open

LIST PRICES

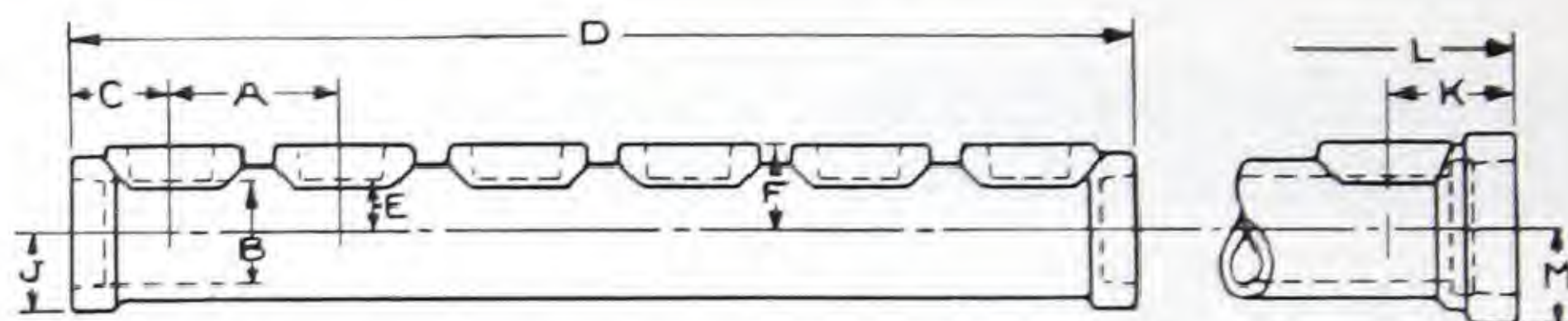
Number of Branches	1-IN. BRANCHES				1¼-IN. BR.			1½-IN. BR.			2-IN. BR.	
	2½-IN. CENTER TO CENTER				3-IN. CENTER TO CENTER			3½-IN. CENTER TO CENTER			4½-IN. C'T'R TO CENTER	
	RUN				RUN			RUN			RUN	
	1" 1¼"	1½"	2"	2½"	1¼" 1½"	2"	2½"	1½" 2"	2½"	3"	2"	2½" 3"
2	.90	1.00	1.15	...	1.30	1.50	1.95	2.10	2.85	...	...	...
3	1.05	1.15	1.35	...	1.65	1.90	2.40	2.70	3.45	...	5.25	5.75
4	1.15	1.30	1.60	2.40	2.00	2.40	2.85	3.35	4.15	...	6.40	7.00
5	1.35	1.45	1.85	2.75	2.40	2.90	3.55	4.00	5.00	...	7.65	8.50
6	1.60	1.75	2.10	3.10	2.80	3.30	3.95	4.65	5.75	...	8.80	9.75
7	1.90	2.20	2.45	3.50	3.20	3.90	4.20	5.25	6.50	7.25	10.60	11.75
8	2.20	2.45	2.75	3.75	3.60	4.50	4.95	5.85	7.00	7.75	11.50	12.75
9	2.65	2.90	3.40	4.30	4.30	5.25	6.15	6.50	8.25	9.00	12.25	13.50
10	3.15	3.30	4.00	5.00	4.80	5.85	6.85	7.60	9.25	10.00	...	...
11	3.75	4.50	4.80	5.50	5.00	6.25	7.25	8.00	9.75	10.75	...	...
12	4.40	4.75	5.10	5.85	5.25	6.50	7.65	8.50	10.50	11.50	...	...
13	5.00	5.50	6.00	...	6.00	7.00	...	9.50	11.50	...	...	...

End Back, Back or Side Outlets charged as additional Front Outlets.
 Sizes not covered by above list prices will be charged at special net prices.
 See following pages for Dimensions.

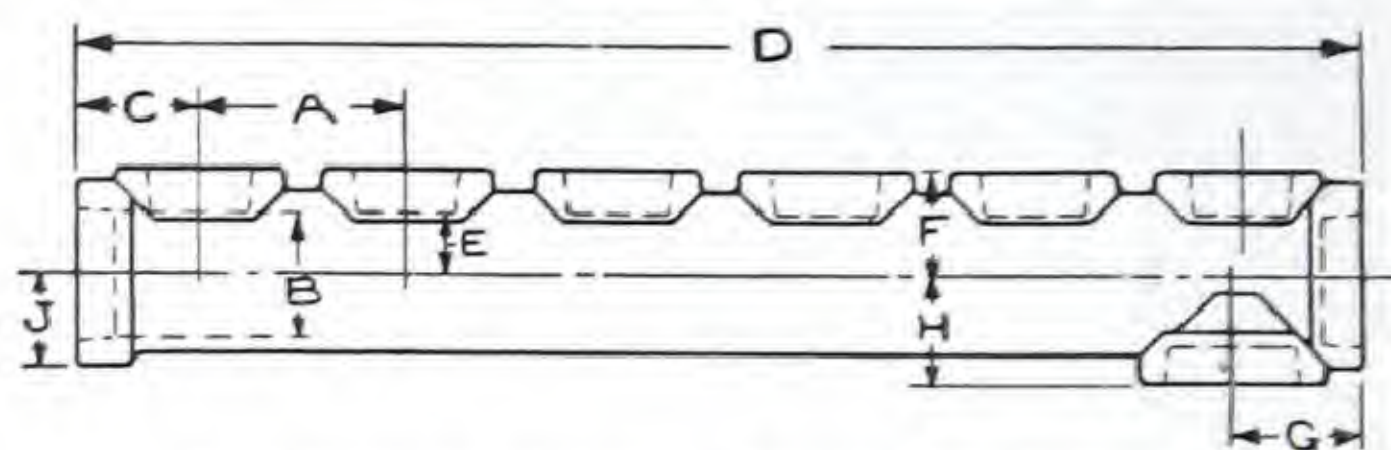
Order by Figure Number—See opposite page.

DIMENSIONS C. I. Branch Tees

125 Lbs. Steam Pressure



Both Ends (B. E.)—Fig. No. 391



End Back Outlet (E. B. O.)—Fig. No. 392

1-INCH BRANCH TEES

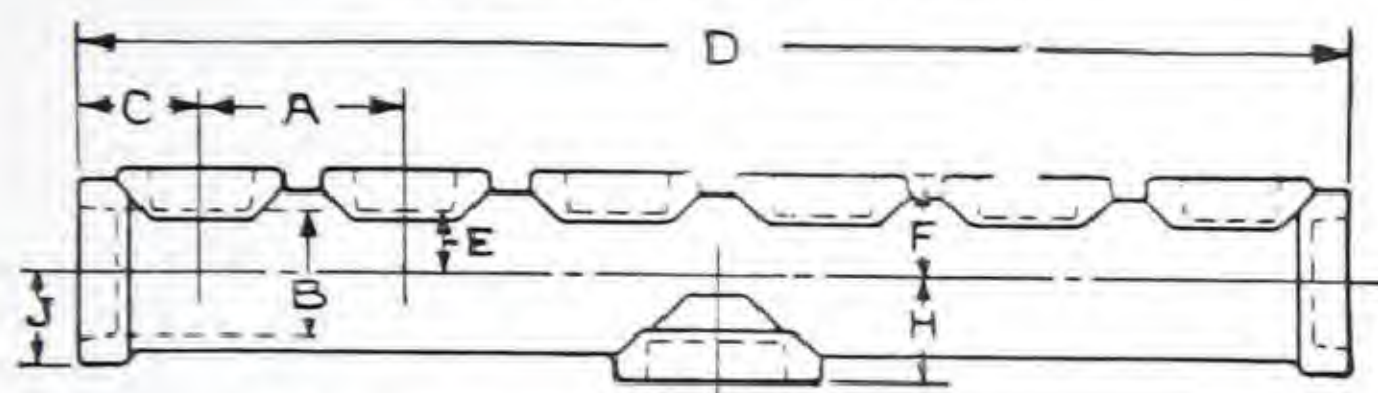
Number of Branches	Body No.	Nominal Size Ends, Back, Side								Enlarged Ends			
			Center to Center	Inside Diameter	Center to End	Length	Center to End of Pipe	Center to Face of Br.	1/2 Diam. of Band	Size of Ends	Center to End	Length	1/2 Diam. of Band
A	B	C	D	E	F	J	K	L	M				
2	1	1 1/2	2 1/2	1 15/16	1 11/16	5 7/8	1 5/16	1 1/2	1 3/8	2	2 1/16	6 5/8	1 21/32
3	1	1 1/2	"	"	"	8 3/8	"	"	"	2	"	9 1/8	"
4	1	1 1/2	"	"	"	10 7/8	"	"	"	2	"	11 5/8	"
5	1	1 1/2	"	"	"	13 3/8	"	"	"	2	"	14 1/8	"
6	1	1 1/2	"	"	"	15 7/8	"	"	"	2	"	16 5/8	"
4	2	2	2 1/2	2 13/32	1 3/4	11	1 3/16	1 3/4	1 21/32	2 1/2	2 5/16	12 1/8	1 5 1/4
5	2	2	"	"	"	13 1/2	"	"	"	2 1/2	"	14 5/8	"
6	2	2	"	"	"	16	"	"	"	2 1/2	"	17 1/8	"
7	2	2	"	"	"	18 1/2	"	"	"	2 1/2	"	19 5/8	"
8	2	2	"	"	"	21	"	"	"	2 1/2	"	22 1/8	"
9	2	2	"	"	"	23 1/2	"	"	"	2 1/2	"	24 5/8	"
10	2	2	"	"	"	26	"	"	"	2 1/2	"	27 1/8	"
11	2	2	"	"	"	28 1/2	"	"	"	2 1/2	"	29 5/8	"
12	2	2	"	"	"	31	"	"	"	2 1/2	"	32 1/8	"

List Prices on page 93.

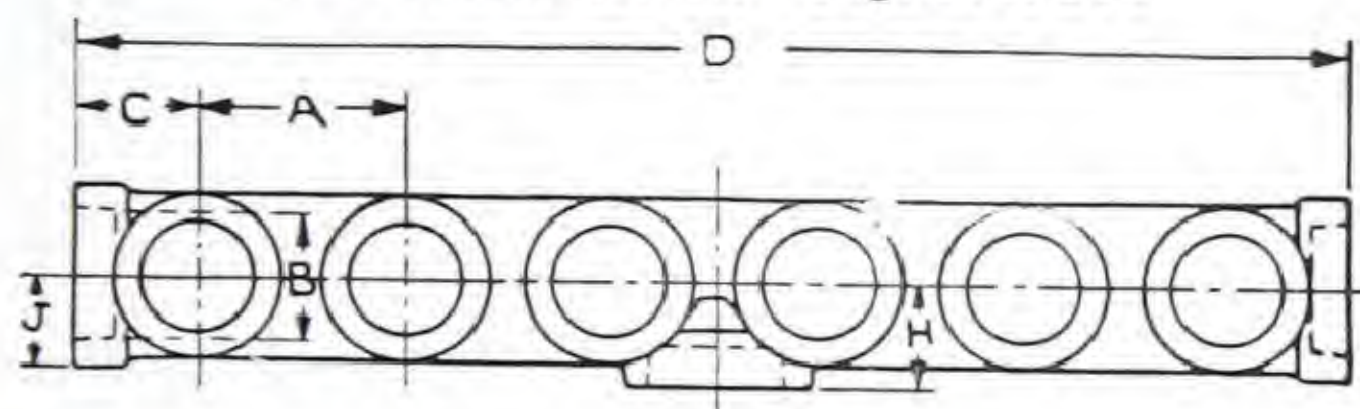
Dimensions G and H furnished on application.

Order by Figure Number—See page 92.

DIMENSIONS
C. I. Branch Tees (Continued)
125 Lbs. Steam Pressure



Back Outlet (B. O.)—Fig. No. 393



Side Outlet (S. O.)—Fig. No. 394

1 1/4-INCH BRANCH TEES

Number of Branches	Body No.	Nominal Size Ends, Back, Side								Enlarged Ends			
			Center to Center	Inside Diameter	Center to End	Length	Center to End of Pipe	Center to Face of Br.	1/2 Diam. of Band	Size of Ends	Center to End	Length	1/2 Diam. Band
			A	B	C	D	E	F	J		K	L	M
2	1	1 1/2	3	1 15/16	1 13/16	6 5/8	1 5/16	1 9/16	1 23/64	2	2 1/4	7 1/2	1 21/32
3	1	1 1/2	"	"	"	9 5/8	"	"	"	2	"	10 1/2	"
4	1	1 1/2	"	"	"	12 5/8	"	"	"	2	"	13 1/2	"
5	1	1 1/2	"	"	"	15 5/8	"	"	"	2	"	16 1/2	"
6	1	1 1/2	"	"	"	18 5/8	"	"	"	2	"	19 1/2	"
2	2	2	3	2 13/32	1 7/8	6 3/4	1 3/16	1 13/16	1 21/32	2 1/2	2 1/2	8	1 5/16
3	2	2	"	"	"	9 3/4	"	"	"	2 1/2	"	11	"
4	2	2	"	"	"	12 3/4	"	"	"	2 1/2	"	14	"
5	2	2	"	"	"	15 3/4	"	"	"	2 1/2	"	17	"
6	2	2	"	"	"	18 3/4	"	"	"	2 1/2	"	20	"
7	2	2	"	"	"	21 3/4	"	"	"	2 1/2	"	23	"
8	2	2	"	"	"	24 3/4	"	"	"	2 1/2	"	26	"
9	2	2	"	"	"	27 3/4	"	"	"	2 1/2	"	29	"
10	2	2	"	"	"	30 3/4	"	"	"	2 1/2	"	32	"
11	2	2	"	"	"	33 3/4	"	"	"	2 1/2	"	35	"
12	2	2	"	"	"	36 3/4	"	"	"	2 1/2	"	38	"

List Prices on page 93.

Dimensions G and H furnished on application.

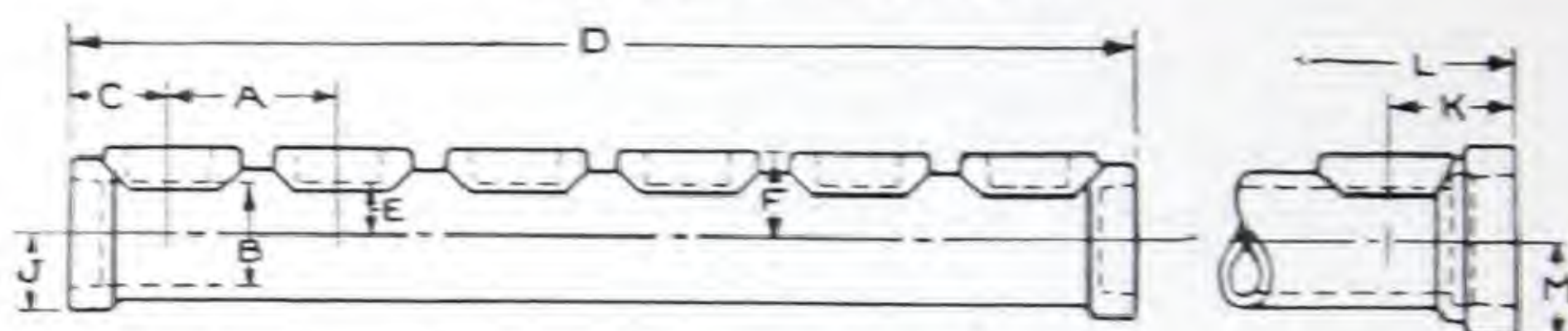
Order by Figure Number—See page 92.

(Continued)

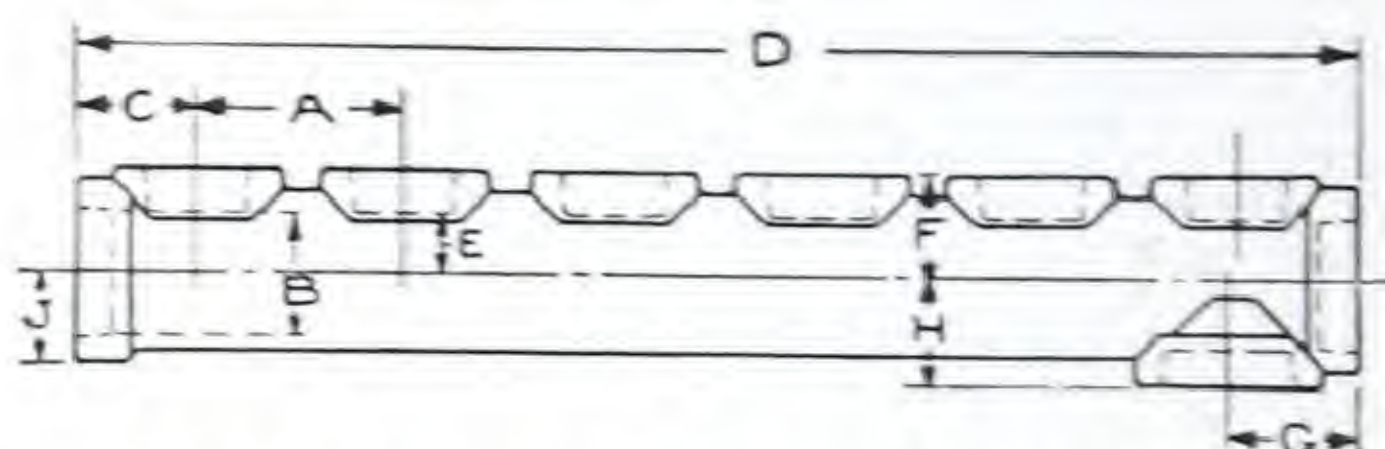
DIMENSIONS

C. I. Branch Tees (Continued)

125 Lbs. Steam Pressure



Both Ends (B. E.)—Fig. No. 391



End Back Outlet (E. B. O.)—Fig. No. 392

1½-INCH BRANCH TEES

Number of Branches	Body No.	Nominal Size Ends, Back, Side	Enlarged Ends										
			Center to Center	Inside Diameter	Center to End	Length	Center to End of Pipe	Center to Face of Br.	½ Diam. of Band	Size of Ends	Center to End	Length	½ Diam. of Band
			A	B	C	D	E	F	J		K	L	M
2	2	2	3½	2½	2	7½	1¼	1⅞	1½	2½	2⅝	8¾	1½
3	2	2	"	"	"	11	"	"	"	2½	"	12¼	"
4	2	2	"	"	"	14½	"	"	"	2½	"	15¾	"
5	2	2	"	"	"	18	"	"	"	2½	"	19¼	"
6	2	2	"	"	"	21½	"	"	"	2½	"	22¾	"
7	3	2½	3½	2½	2⅝	25⅜	1½	2⅞	1⅝	3	2¾	26½	2⅝
8	3	2½	"	"	"	28⅞	"	"	"	3	"	30	"
9	3	2½	"	"	"	32⅜	"	"	"	3	"	33½	"
10	3	2½	"	"	"	35⅞	"	"	"	3	"	37	"
11	3	2½	"	"	"	39⅜	"	"	"	3	"	40½	"
12	3	2½	"	"	"	42⅞	"	"	"	3	"	44	"

List Prices on page 93.

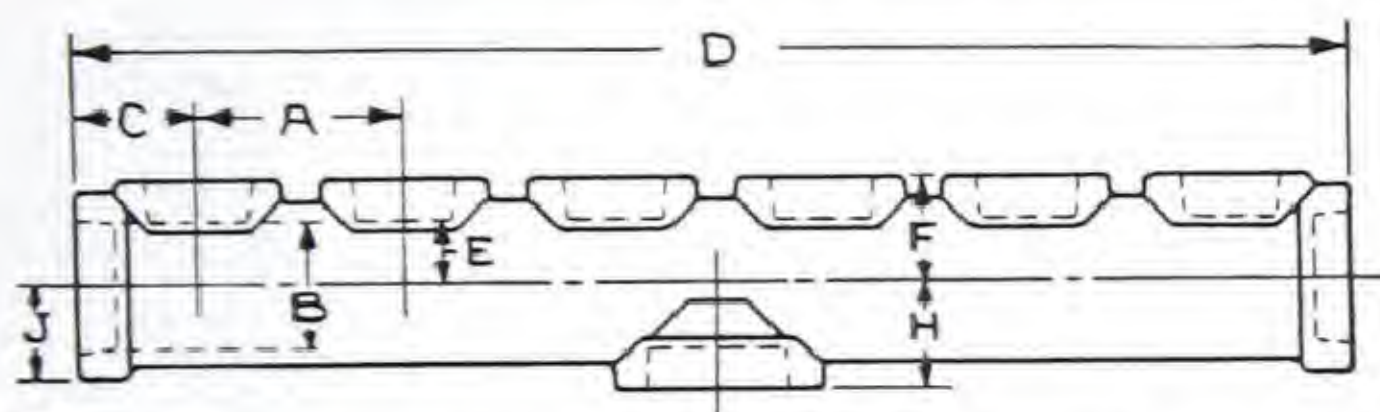
Dimensions G and H furnished on application.

Order by Figure Number—See page 92.

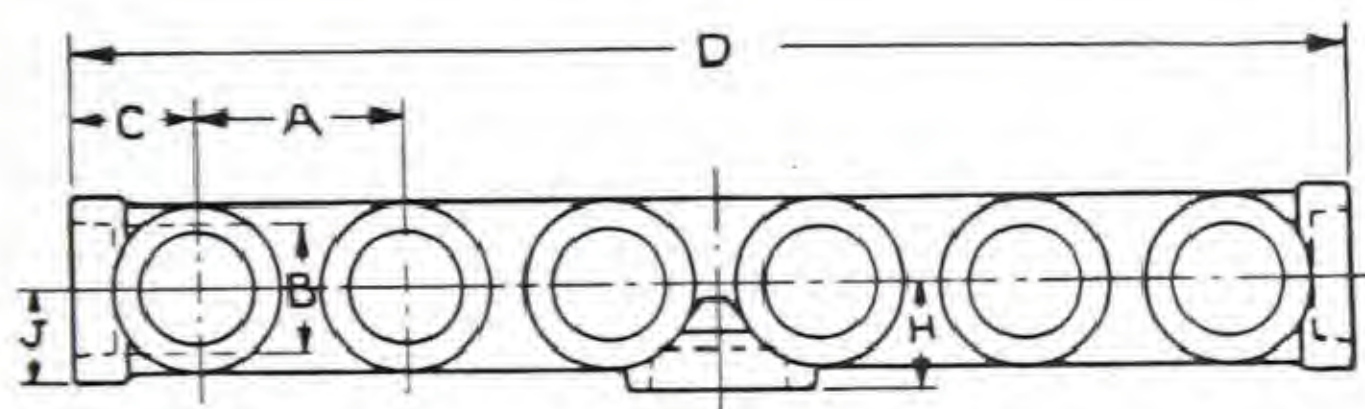
DIMENSIONS

C. I. Branch Tees (Continued)

125 Lbs. Steam Pressure



Back Outlet (B. O.)—Fig. No. 393



Side Outlet (S. O.)—Fig. No. 394

2-INCH BRANCH TEES

Number of Branches	Body No.	Nominal Size Ends, Back, Side	Center to Center	Inside Diameter	Center to End	Length	Center to End of Pipe	Center to Face of Br.	$\frac{1}{2}$ Diam. of Band
			A	B	C		E	F	
4	3	2 $\frac{1}{2}$	4 $\frac{1}{2}$	2 $\frac{29}{32}$	2 $\frac{7}{16}$	18 $\frac{3}{8}$	1 $\frac{9}{16}$	2 $\frac{1}{4}$	1 $\frac{61}{64}$
5	3	2 $\frac{1}{2}$	"	"	"	22 $\frac{7}{8}$	"	"	"
6	3	2 $\frac{1}{2}$	"	"	"	27 $\frac{3}{8}$	"	"	"
8	4	3	4 $\frac{1}{2}$	3 $\frac{17}{32}$	2 $\frac{9}{16}$	36 $\frac{5}{8}$	1 $\frac{13}{16}$	2 $\frac{1}{2}$	2 $\frac{21}{64}$

List Prices on page 93.
Dimensions G and H furnished on application.
Order by Figure Number—See page 92.

GRINNELL CAST IRON FITTINGS

Extra Heavy Screwed Fittings

*For Steam Working Pressures up to 250 Lbs.
For Water Working Pressures up to 400 Lbs.*

Grinnell Extra Heavy Cast Iron Screwed Fittings meet every demand for a high grade fitting, in design, utility and strength.

Grinnell Extra Heavy Cast Iron Screwed Fittings are tapped straight and accurately to gauge, all fittings are chamfered, permitting an easy entrance of the pipe.

INCREASED VARIETY OF SIZES

We believe the large variety of straight and reducing sizes tabulated on pages 102 and 103 will be found sufficient to meet the demands of the trade.

Should sizes be required not given in tabulation referred to above, we advise the use of bushings.

Where it is necessary to have special fittings made without the use of bushings, we will upon receipt of inquiry quote prices. Unless the inquiry calls for large quantities, special fittings are expensive.

GALVANIZED FITTINGS

Extra Heavy Cast Iron Fittings as listed on pages 102 and 103 will be galvanized to order only.

TESTED FITTINGS

Tested Fittings will be made to order. Prices according to quantity wanted. Please specify whether these fittings are to be used for steam, water, gas or air.

GRINNELL EXTRA HEAVY CAST IRON FITTINGS

Extra Heavy Elbows

250 Lbs. Steam Pressure

400 Lbs. Water Pressure

Elbow, Straight
Fig. No. 421Elbow, Reducing
Fig. No. 422Elbow, 45°
Fig. No. 424

EXTRA HEAVY ELBOWS, STRAIGHT—Fig. No. 421

Size.....Inches	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3
Price.....Each	.20	.20	.25	.30	.35	.45	.60	.75	1.25	2.00
Size.....Inches	3 1/2	4	4 1/2	5	6	7	8	9	10	12
Price.....Each	2.75	3.50	4.25	5.50	8.00	12.00	17.00	25.00	28.00	40.00

EXTRA HEAVY ELBOWS, REDUCING—Fig. No. 422

Size.....Inches	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3
Price.....Each	.35	.35	.40	.45	.55	.75	.95	1.55	2.50
Size.....Inches	3 1/2	4	4 1/2	5	6	7	8	10	12
Price.....Each	3.40	4.40	5.30	6.80	10.00	15.00	21.00	35.00	50.00

EXTRA HEAVY ELBOWS, 45°—Fig. No. 424

Size.....Inches	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3
Price.....Each	.30	.30	.35	.40	.44	.55	.70	.90	1.50	2.50
Size.....Inches	3 1/2	4	4 1/2	5	6	7	8	9	10	12
Price.....Each	3.50	4.50	5.50	6.75	9.75	14.50	21.00	31.00	34.00	48.00

For galvanized, double above lists.

For right and left elbows add 20 per cent. to above lists.

Order by Figure Number.

GRINNELL EXTRAHEAVY CAST IRON FITTINGS

Extra Heavy Tees—Crosses

250 Lbs. Steam Pressure

400 Lbs. Water Pressure



Tee, Straight—Fig. No. 425



Tees, Reducing—Fig. No. 426



Cross, Straight—Fig. No. 427



Cross, Reducing—Fig. No. 428

EXTRA HEAVY TEES, STRAIGHT—Fig. No. 425

Size.... Inches	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3
Price.... Each	.35	.35	.40	.45	.55	.70	.90	1.15	1.80	3.00
Size.... Inches	3 1/2	4	4 1/2	5	6	7	8	9	10	12
Price.... Each	4.25	5.50	6.75	8.25	12.00	18.00	25.00	35.00	42.00	60.00

EXTRA HEAVY TEES, REDUCING—Fig. No. 426

Size.....Inches	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	
Price.....Each	.55	.55	.60	.70	.90	1.15	1.40	2.25	3.75	
Size....Inches	3 1/2	4	4 1/2	5	6	7	8	9	10	12
Price....Each	5.30	6.85	8.50	10.25	15.00	22.50	31.00	44.00	52.00	75.00

EXTRA HEAVY CROSSES, STRAIGHT—Fig. No. 427

Size.... Inches	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3
Price.... Each	.60	.60	.60	.65	.70	.90	1.20	1.50	2.50	4.00
Size.... Inches	3 1/2	4	4 1/2	5	6	7	8	9	10	12
Price.... Each	5.50	7.00	8.50	11.00	16.00	24.00	34.00	48.00	56.00	80.00

EXTRA HEAVY CROSSES, REDUCING—Fig. No. 428

Size.....Inches	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	
Price.....Each	.80	.80	.85	.90	1.15	1.50	1.85	3.15	5.00	
Size.... Inches	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	6	7	8	9	10	12
Price.... Each	6.85	8.75	10.00	13.75	20.00	30.00	42.00	60.00	70.00	100.00

For galvanized, double above lists.
Order by Figure Number.

GRINNELL EXTRA HEAVY CAST IRON FITTINGS

Extra Heavy Y's—Return Bends—etc.

250 Lbs. Steam Pressure

400 Lbs. Water Pressure



Y or Lateral—Fig. No. 431



Return Bend—Fig. No. 435



Reducer—Fig. No. 433



Solid Plug—Fig. No. 388

EXTRA HEAVY Y'S OR LATERALS—Fig. No. 431

Size.....Inches	1	1¼	1½	2	2½	3	3½
Straight.....Each	1.10	1.35	1.80	2.25	3.75	6.00	8.25
Reducing.....Each	1.38	1.75	2.25	2.88	4.50	7.50	10.63
Size.....Inches	4	4½	5	6	7	8	...
Straight.....Each	11.00	13.50	16.50	24.00	36.00	50.00	...
Reducing.....Each	13.75	16.88	20.63	30.00	45.00	62.50	...

EXTRA HEAVY RETURN BENDS—Fig. No. 435

Size.....Inches	1	1¼	1½	2	2½	3	3½
Center to Center.....Inches	2¾	2½	3	4	5	6	...
Price, R.H.....Each	.45	.45	.50	.60	.70	.85	...
Price, R.&L.....Each	.52	.52	...	...	...	...	...
Size.....Inches	1¼	1½	1½	2	2	2	...
Center to Center.....Inches	8	2½	3½	3¼	4½	6	...
Price, R.H.....Each	1.10	.80	1.25	1.00	1.75	2.00	...
Price, R.&L.....Each	...	.90	1.45	1.15	...	...	...

EXTRA HEAVY REDUCERS—Fig. No. 433

Size.....Inches	½	¾	1	1¼	1½	2	2½	3	3½
Price.....Each	.28	.33	.39	.50	.66	.83	1.38	2.20	3.05
Size.....Inches	4	4½	5	6	7	8	9	10	12
Price.....Each	3.85	4.68	6.00	8.80	13.20	18.75	27.50	31.00	44.00

SOLID PLUGS—Fig. No. 388

Size.....Inches	¼	⅜	½	¾	1	1¼	1½	2	2½	3
Price.....Each	.04	.04	.04	.06	.08	.09	.11	.15	.27	.38
Size.....Inches	3½	4	4½	5	6	7	8	9	10	12
Price.....Each	.57	.63	1.00	1.35	1.80	2.80	4.15	5.00	5.75	7.50

For galvanized, double above lists.
Order by Figure Number.

LIST OF SIZES

Grinnell Extra Heavy Cast Iron Fittings

Sizes differing from Standard Sizes, if furnished, will be charged at special net prices.

EXTRA HEAVY ELBOWS—STRAIGHT SIZES

Size Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Size Inches	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	6	7	8	..	10	12

EXTRA HEAVY ELBOWS—REDUCING SIZES

$\frac{3}{4}$ x $\frac{1}{2}$	$1\frac{1}{2}$ x $1\frac{1}{4}$	2 x $1\frac{1}{4}$	$2\frac{1}{2}$ x $1\frac{1}{2}$	4 x 3
1 x $\frac{3}{4}$	$1\frac{1}{2}$ x 1	2 x 1	3 x $2\frac{1}{2}$	5 x 4
$1\frac{1}{4}$ x 1	2 x $1\frac{1}{2}$	$2\frac{1}{2}$ x 2	3 x 2	

EXTRA HEAVY ELBOWS—RIGHT AND LEFT—STRAIGHT SIZES

Size Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
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EXTRA HEAVY 45° ELBOWS

Size Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Size Inches	$3\frac{1}{2}$	4	5	6	7	8	10	12

EXTRA HEAVY TEES—STRAIGHT SIZES

Straight Sizes	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Straight Sizes	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	6	7	8	..	10	12

EXTRA HEAVY TEES—REDUCING SIZES

$\frac{3}{4}$ x $\frac{3}{4}$ x $\frac{1}{2}$	$1\frac{1}{4}$ x $1\frac{1}{4}$ x $\frac{1}{2}$	$1\frac{1}{2}$ x $1\frac{1}{2}$ x $\frac{1}{2}$	2 x 2 x $1\frac{1}{2}$
$\frac{3}{4}$ x $\frac{3}{4}$ x $\frac{1}{4}$	$1\frac{1}{4}$ x $1\frac{1}{4}$ x $\frac{1}{4}$	$1\frac{1}{2}$ x $1\frac{1}{2}$ x $\frac{1}{4}$	2 x 2 x $1\frac{1}{4}$
$\frac{3}{4}$ x $\frac{1}{2}$ x $\frac{1}{2}$	$1\frac{1}{4}$ x 1 x $1\frac{1}{4}$	$1\frac{1}{2}$ x $1\frac{1}{4}$ x $1\frac{1}{2}$	2 x 2 x 1
	$1\frac{1}{4}$ x 1 x 1	$1\frac{1}{2}$ x $1\frac{1}{4}$ x $1\frac{1}{4}$	2 x 2 x $\frac{3}{4}$
1 x 1 x $\frac{3}{4}$	$1\frac{1}{4}$ x 1 x $\frac{3}{4}$	$1\frac{1}{2}$ x $1\frac{1}{4}$ x $\frac{3}{4}$	2 x 2 x $\frac{1}{2}$
1 x 1 x $\frac{1}{2}$	$1\frac{1}{4}$ x 1 x $\frac{1}{2}$	$1\frac{1}{2}$ x $1\frac{1}{4}$ x $\frac{1}{2}$	2 x 2 x $\frac{1}{4}$
1 x 1 x $\frac{1}{4}$	$1\frac{1}{4}$ x $\frac{3}{4}$ x $1\frac{1}{4}$	$1\frac{1}{2}$ x 1 x $1\frac{1}{2}$	2 x $1\frac{1}{2}$ x 2
1 x $\frac{3}{4}$ x $\frac{3}{4}$	$1\frac{1}{4}$ x $\frac{1}{2}$ x $1\frac{1}{4}$	$1\frac{1}{2}$ x 1 x $1\frac{1}{4}$	2 x $1\frac{1}{2}$ x $1\frac{1}{2}$
1 x $\frac{3}{4}$ x $\frac{1}{2}$	$1\frac{1}{4}$ x $\frac{1}{2}$ x 1	$1\frac{1}{2}$ x 1 x 1	2 x $1\frac{1}{2}$ x $1\frac{1}{4}$
1 x $\frac{1}{2}$ x 1	$1\frac{1}{4}$ x $\frac{1}{4}$ x $1\frac{1}{4}$	$1\frac{1}{2}$ x $\frac{3}{4}$ x $1\frac{1}{2}$	2 x $1\frac{1}{2}$ x 1
1 x $\frac{1}{2}$ x $\frac{3}{4}$	1 x 1 x $1\frac{1}{4}$	$1\frac{1}{2}$ x $\frac{1}{2}$ x $1\frac{1}{2}$	2 x $1\frac{1}{2}$ x $\frac{3}{4}$
1 x $\frac{1}{4}$ x 1	1 x $\frac{3}{4}$ x $1\frac{1}{4}$	$1\frac{1}{4}$ x $1\frac{1}{4}$ x $1\frac{1}{2}$	2 x $1\frac{1}{2}$ x $\frac{1}{2}$
$\frac{3}{4}$ x $\frac{3}{4}$ x 1	$1\frac{1}{2}$ x $1\frac{1}{2}$ x $1\frac{1}{4}$	$1\frac{1}{4}$ x 1 x $1\frac{1}{2}$	2 x $1\frac{1}{4}$ x 2
$1\frac{1}{4}$ x $1\frac{1}{4}$ x 1	$1\frac{1}{2}$ x $1\frac{1}{2}$ x 1	$1\frac{1}{4}$ x $\frac{3}{4}$ x $1\frac{1}{2}$	2 x $1\frac{1}{4}$ x $1\frac{1}{4}$
$1\frac{1}{4}$ x $1\frac{1}{4}$ x $\frac{3}{4}$	$1\frac{1}{2}$ x $1\frac{1}{2}$ x $\frac{3}{4}$	1 x 1 x $1\frac{1}{2}$	2 x 1 x 2

LIST OF SIZES

Extra Heavy Cast Iron Fittings

(Continued)

EXTRA HEAVY TEES—REDUCING SIZES—Continued

2 x1 x1½	2½x1 x2½	3½x3½x2	6 x6 x4
2 x ¾x2	2½x ¾x2½	3½x3 x2	6 x6 x3½
2 x ½x2	2 x2 x2½	3½x2½x2½	6 x6 x3
1½x1½x2	2 x1½x2½		6 x6 x2½
1½x1¼x2	1½x1½x2½	4 x4 x3	6 x6 x2
1½x1 x2		4 x4 x2½	6 x4 x6
1½x ¾x2	3 x3 x2½	4 x4 x2	6 x4 x4
1¼x1¼x2	3 x3 x2	4 x4 x1½	
	3 x3 x1½	4 x4 x1	7 x7 x5
2½x2½x2	3 x3 x1¼	4 x3 x4	8 x8 x6
2½x2½x1½	3 x3 x1	4 x3 x3	8 x8 x5
2½x2½x1¼	3 x2½x3	4 x2½x4	8 x8 x4
2½x2½x1	3 x2½x2½	4 x2½x2½	8 x8 x3
2½x2½x ¾	3 x2½x2	4 x2 x4	8 x6 x6
2½x2½x ½	3 x2½x1½	3 x3 x4	8 x6 x4
2½x2 x2½	3 x2 x3	5 x5 x4	
2½x2 x2	3 x2 x2½	5 x5 x3	10 x10 x8
2½x2 x1½	3 x2 x2	5 x5 x2½	10 x10 x6
2½x2 x1	3 x2 x1½	5 x5 x2	10 x10 x4
2½x2 x ½	3 x1½x2	5 x3 x5	
2½x1½x2½	3 x1 x3	5 x2 x5	12 x12 x10
2½x1½x2	2½x2½x3		12 x12 x8
2½x1½x1½	2 x2 x3	6 x6 x5	12 x12 x6

EXTRA HEAVY CROSSES—STRAIGHT SIZES

Size.....Inches	½	¾	1	1¼	1½	2	2½	3
Size.....Inches	3½	4	5	6	8	10	12	..

EXTRA HEAVY Y's—STRAIGHT SIZES

Size.....Inches	1¼	1½	2	2½	3	4
Size.....Inches	5	6	7	8	..	..

SOLID PLUGS

Size.....Inches	¼	⅜	½	¾	1	1¼	1½	2	2½	3
Size.....Inches	3½	4	4½	5	6	7	8	9	10	12

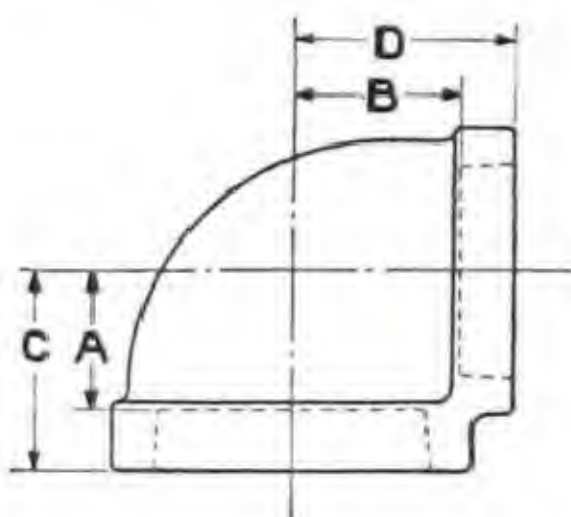
Extra Heavy Crosses and Y's are not carried in stock in reducing sizes, but will be made to order at a special price, according to the quantity wanted.

DIMENSIONS

Extra Heavy Cast Iron Elbows

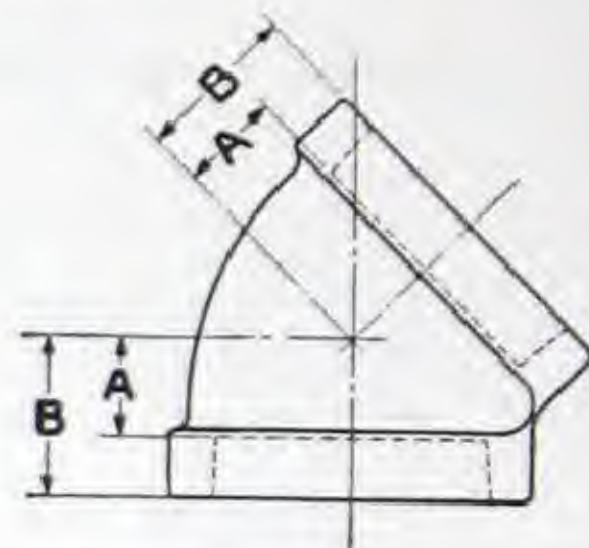
250 Lbs. Steam Pressure

400 Lbs. Water Pressure



Elbow—Fig. No. 421

Red. Elbow—Fig. No. 422



Angle Elbow

Fig. No. 424

Fig. Nos. 421, 422 { Dimensions A and B = End of Pipe
 { Dimensions C and D = Face of Fitting
 Fig. No. 424 { Dimension A = End of Pipe
 { Dimension B = Face of Fitting

ELBOWS—Fig. Nos. 421, 422

ANGLE ELBOWS—424

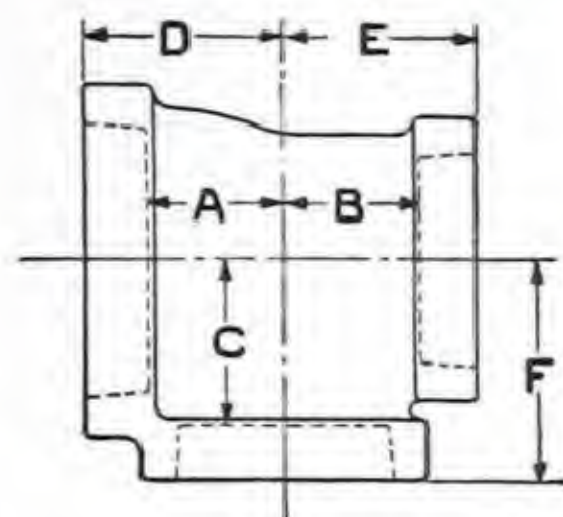
SIZE	A	B	C	D	SIZE	A	B
$\frac{1}{4}$	$\frac{5}{8}$	$\frac{5}{8}$	$\frac{15}{16}$	$\frac{15}{16}$	...	...	...
$\frac{3}{8}$	$\frac{11}{16}$	$\frac{11}{16}$	$1\frac{1}{16}$	$1\frac{1}{16}$	...	...	...
$\frac{1}{2}$	$\frac{3}{4}$	$\frac{3}{4}$	$1\frac{1}{4}$	$1\frac{1}{4}$	$\frac{1}{2}$	$\frac{7}{16}$	$\frac{15}{16}$
$\frac{3}{4}$	$\frac{7}{8}$	$\frac{7}{8}$	$1\frac{7}{16}$	$1\frac{7}{16}$	$\frac{3}{4}$	$\frac{1}{2}$	$1\frac{1}{16}$
$\frac{3}{4}$ x $\frac{1}{2}$	$\frac{3}{4}$	$\frac{7}{8}$	$1\frac{5}{16}$	$1\frac{3}{8}$	...	...	...
1	1	1	$1\frac{5}{8}$	$1\frac{5}{8}$	1	$\frac{9}{16}$	$1\frac{3}{16}$
1 x $\frac{3}{4}$	$\frac{7}{8}$	$\frac{15}{16}$	$1\frac{1}{2}$	$1\frac{1}{2}$	...	...	...
$1\frac{1}{4}$	$1\frac{3}{16}$	$1\frac{3}{16}$	$1\frac{15}{16}$	$1\frac{15}{16}$	$1\frac{1}{4}$	$\frac{3}{4}$	$1\frac{7}{16}$
$1\frac{1}{4}$ x 1	$1\frac{1}{16}$	$1\frac{1}{4}$	$1\frac{3}{4}$	$1\frac{7}{8}$	...	...	...
$1\frac{1}{2}$	$1\frac{7}{16}$	$1\frac{7}{16}$	$2\frac{1}{8}$	$2\frac{1}{8}$	$1\frac{1}{2}$	$\frac{7}{8}$	$1\frac{9}{16}$
$1\frac{1}{2}$ x $1\frac{1}{4}$	$1\frac{5}{16}$	$1\frac{7}{16}$	2	$2\frac{1}{8}$	...	...	...
2	$1\frac{3}{4}$	$1\frac{3}{4}$	$2\frac{1}{2}$	$2\frac{1}{2}$	2	$1\frac{1}{8}$	$1\frac{7}{8}$
2 x $1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{11}{16}$	$2\frac{1}{4}$	$2\frac{3}{8}$	...	...	...
$2\frac{1}{2}$	$1\frac{15}{16}$	$1\frac{15}{16}$	$2\frac{15}{16}$	$2\frac{15}{16}$	$2\frac{1}{2}$	$1\frac{3}{16}$	$2\frac{3}{16}$
$2\frac{1}{2}$ x 2	$1\frac{11}{16}$	2	$2\frac{11}{16}$	$2\frac{3}{4}$	...	...	...
3	$2\frac{5}{16}$	$2\frac{5}{16}$	$3\frac{3}{8}$	$3\frac{3}{8}$	3	$1\frac{3}{8}$	$2\frac{7}{16}$
3 x $2\frac{1}{2}$	2	$2\frac{5}{16}$	$3\frac{1}{16}$	$3\frac{5}{16}$	...	...	...
$3\frac{1}{2}$	$2\frac{5}{8}$	$2\frac{5}{8}$	$3\frac{3}{4}$	$3\frac{3}{4}$	$3\frac{1}{2}$	$1\frac{1}{2}$	$2\frac{5}{8}$
4	$2\frac{15}{16}$	$2\frac{15}{16}$	$4\frac{1}{8}$	$4\frac{1}{8}$	4	$1\frac{11}{16}$	$2\frac{7}{8}$
4 x 3	$2\frac{7}{16}$	$1\frac{15}{16}$	$3\frac{5}{8}$	4	...	...	...
$4\frac{1}{2}$	$3\frac{3}{16}$	$3\frac{3}{16}$	$4\frac{7}{16}$	$4\frac{7}{16}$	...	...	...
5	$3\frac{9}{16}$	$3\frac{9}{16}$	$4\frac{7}{8}$	$4\frac{7}{8}$	5	$1\frac{15}{16}$	$3\frac{1}{4}$
6	$4\frac{1}{4}$	$4\frac{1}{4}$	$5\frac{5}{8}$	$5\frac{5}{8}$	6	$2\frac{5}{16}$	$3\frac{11}{16}$
8	$5\frac{9}{16}$	$5\frac{9}{16}$	$7\frac{1}{16}$	$7\frac{1}{16}$	8	3	$4\frac{1}{2}$
10	7	7	$8\frac{5}{8}$	$8\frac{5}{8}$	10	$3\frac{3}{4}$	$5\frac{3}{8}$
12	$8\frac{3}{16}$	$8\frac{3}{16}$	$10\frac{1}{16}$	$10\frac{1}{16}$	12	$4\frac{1}{4}$	$6\frac{1}{8}$

DIMENSIONS

Extra Heavy Cast Iron Tees

250 Lbs. Steam Pressure

400 Lbs. Water Pressure



Tees—Fig. Nos. 425, 426

Dimensions A, B, and C = End of Pipe
 Dimensions D, E, and F = Face of Fitting

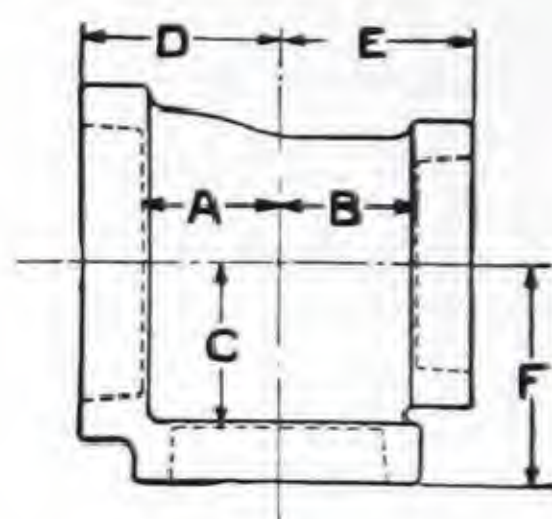
SIZE			DIMENSIONS					
			A	B	C	D	E	F
$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{5}{8}$	$\frac{5}{8}$	$\frac{5}{8}$	$1\frac{15}{16}$	$1\frac{15}{16}$	$1\frac{15}{16}$
$\frac{3}{8}$	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{11}{16}$	$\frac{11}{16}$	$\frac{11}{16}$	$1\frac{1}{16}$	$1\frac{1}{16}$	$1\frac{1}{16}$
$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$	$1\frac{1}{4}$	$1\frac{1}{4}$	$1\frac{1}{4}$
$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{7}{8}$	$\frac{7}{8}$	$\frac{7}{8}$	$1\frac{7}{16}$	$1\frac{7}{16}$	$1\frac{7}{16}$
$\frac{3}{4}$	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{7}{8}$	$1\frac{5}{16}$	$1\frac{5}{16}$	$1\frac{3}{8}$
$\frac{3}{4}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{13}{16}$	$\frac{7}{8}$	$1\frac{3}{16}$	$1\frac{5}{16}$	$1\frac{3}{8}$
1	1	1	1	1	1	$1\frac{5}{8}$	$1\frac{5}{8}$	$1\frac{5}{8}$
1	1	$\frac{3}{4}$	$\frac{7}{8}$	$\frac{7}{8}$	1	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{9}{16}$
1	1	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{3}{4}$	1	$1\frac{3}{8}$	$1\frac{3}{8}$	$1\frac{1}{2}$
1	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{7}{8}$	$\frac{7}{8}$	1	$1\frac{1}{2}$	$1\frac{7}{16}$	$1\frac{9}{16}$
1	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{3}{4}$	1	$1\frac{3}{8}$	$1\frac{5}{16}$	$1\frac{1}{2}$
1	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{7}{8}$	$\frac{15}{16}$	1	$1\frac{1}{2}$	$1\frac{7}{16}$	$1\frac{9}{16}$
1	$\frac{1}{4}$	1	1	$1\frac{5}{16}$	1	$1\frac{5}{8}$	$1\frac{5}{8}$	$1\frac{5}{8}$
$\frac{3}{4}$	$\frac{3}{4}$	1	1	1	$\frac{7}{8}$	$1\frac{9}{16}$	$1\frac{9}{16}$	$1\frac{1}{2}$
$1\frac{1}{4}$	$1\frac{1}{4}$	$1\frac{1}{4}$	$1\frac{3}{16}$	$1\frac{3}{16}$	$1\frac{3}{16}$	$1\frac{15}{16}$	$1\frac{15}{16}$	$1\frac{15}{16}$
$1\frac{1}{4}$	$1\frac{1}{4}$	1	$1\frac{1}{16}$	$1\frac{1}{16}$	$1\frac{3}{16}$	$1\frac{3}{4}$	$1\frac{3}{4}$	$1\frac{13}{16}$
$1\frac{1}{4}$	$1\frac{1}{4}$	$\frac{3}{4}$	$\frac{15}{16}$	$\frac{15}{16}$	$1\frac{1}{8}$	$1\frac{5}{8}$	$1\frac{5}{8}$	$1\frac{11}{16}$
$1\frac{1}{4}$	$1\frac{1}{4}$	$\frac{1}{2}$	$\frac{13}{16}$	$\frac{13}{16}$	$1\frac{3}{16}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{11}{16}$
$1\frac{1}{4}$	1	$\frac{3}{4}$	$\frac{15}{16}$	$\frac{7}{8}$	$1\frac{1}{8}$	$1\frac{5}{8}$	$1\frac{1}{2}$	$1\frac{11}{16}$
$1\frac{1}{4}$	1	$\frac{1}{2}$	$\frac{13}{16}$	$\frac{3}{4}$	$1\frac{3}{16}$	$1\frac{1}{2}$	$1\frac{3}{8}$	$1\frac{11}{16}$
$1\frac{1}{4}$	$\frac{1}{2}$	1	$1\frac{1}{16}$	$1\frac{1}{4}$	$1\frac{3}{16}$	$1\frac{3}{4}$	$1\frac{3}{4}$	$1\frac{13}{16}$
$1\frac{1}{4}$	$\frac{1}{4}$	$1\frac{1}{4}$	$1\frac{3}{16}$	$1\frac{9}{16}$	$1\frac{3}{16}$	$1\frac{15}{16}$	$1\frac{15}{16}$	$1\frac{15}{16}$
1	1	$1\frac{1}{4}$	$1\frac{3}{16}$	$1\frac{3}{16}$	$1\frac{1}{16}$	$1\frac{13}{16}$	$1\frac{13}{16}$	$1\frac{3}{4}$
1	$\frac{3}{4}$	$1\frac{1}{4}$	$1\frac{3}{16}$	$1\frac{1}{4}$	$1\frac{1}{16}$	$1\frac{13}{16}$	$1\frac{13}{16}$	$1\frac{3}{4}$
$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{7}{16}$	$1\frac{7}{16}$	$1\frac{7}{16}$	$2\frac{1}{8}$	$2\frac{1}{8}$	$2\frac{1}{8}$
$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{4}$	$1\frac{5}{16}$	$1\frac{5}{16}$	$1\frac{3}{8}$	2	2	$2\frac{1}{16}$
$1\frac{1}{2}$	$1\frac{1}{2}$	1	$1\frac{1}{8}$	$1\frac{1}{8}$	$1\frac{5}{16}$	$1\frac{13}{16}$	$1\frac{13}{16}$	$1\frac{13}{16}$
$1\frac{1}{2}$	$1\frac{1}{2}$	$\frac{3}{4}$	1	1	$1\frac{1}{4}$	$1\frac{11}{16}$	$1\frac{11}{16}$	$1\frac{7}{8}$

DIMENSIONS

Extra Heavy Cast Iron Tees (Continued)

250 Lbs. Steam Pressure

400 Lbs. Water Pressure



Tees—Fig. Nos. 425, 426

Dimensions A, B and C = End of Pipe
 Dimensions D, E and F = Face of Fitting

SIZE			DIMENSIONS					
			A	B	C	D	E	F
1 1/2	1 1/2	1/2	7/8	7/8	1 5/16	1 5/8	1 5/8	1 13/16
1 1/2	1 1/4	1 1/4	1 5/16	1 5/16	1 3/8	2	2	2 1/16
1 1/2	1 1/4	3/4	1	1 5/16	1 1/4	1 11/16	1 5/8	1 7/8
1 1/2	1 1/4	1/2	7/8	1 3/8	1 5/16	1 5/8	1 1/2	1 13/16
1 1/2	1	1 1/4	1 5/16	1 3/8	1 3/8	2	2	2 1/16
1 1/2	1	1	1 1/8	1 3/16	1 5/16	1 13/16	1 13/16	1 15/16
1 1/2	3/4	1 1/2	1 7/16	1 1/4	1 7/16	2 1/8	1 7/8	2 1/8
1 1/2	1/2	1 1/2	1 7/16	1 5/16	1 7/16	2 1/8	1 7/8	2 1/8
1 1/2	1/2	1 1/4	1 5/16	1 1/2	1 3/8	2	2	2 1/16
1 1/4	1 1/4	1 1/2	1 3/8	1 3/8	1 5/16	2 1/16	2 1/16	2
1 1/4	1	1 1/2	1 3/8	1 7/16	1 5/16	2 1/16	2 1/16	2
1 1/4	3/4	1 1/2	1 3/8	1 1/2	1 5/16	2 1/16	2 1/16	2
1	1	1 1/2	1 7/16	1 7/16	1 5/16	2 1/16	2 1/16	2
2	2	2	1 3/4	1 3/4	1 3/4	2 1/2	2 1/2	2 1/2
2	2	1 1/2	1 1/2	1 1/2	1 5/8	2 5/16	2 5/16	2 5/16
2	2	1 1/4	1 3/8	1 3/8	1 9/16	2 3/16	2 3/16	2 1/4
2	2	1	1 1/4	1 1/4	1 1/2	2	2	2 1/8
2	2	3/4	1 1/8	1 1/8	1 7/16	1 7/8	1 7/8	2
2	2	1/2	1	1	1 1/2	1 3/4	1 3/4	2
2	1 1/2	2	1 3/4	1 13/16	1 3/4	2 1/2	2 1/2	2 1/2
2	1 1/2	1 1/2	1 1/2	1 9/16	1 5/8	2 5/16	2 5/16	2 5/16
2	1 1/2	1 1/4	1 3/8	1 5/16	1 9/16	2 3/16	2	2 1/4
2	1 1/2	1	1 1/4	1 5/16	1 1/2	2	2	2 1/8
2	1 1/2	3/4	1 1/8	1	1 7/16	1 7/8	1 11/16	2
2	1 1/2	1/2	1	1 1/16	1 1/2	1 3/4	1 3/4	2
2	1 1/4	2	1 3/4	1 13/16	1 3/4	2 1/2	2 1/2	2 1/2
2	1 1/4	1 1/4	1 3/8	1 5/16	1 9/16	2 3/16	2	2 1/4
2	1	2	1 3/4	1 1/2	1 3/4	2 1/2	2 1/8	2 1/2
2	1	1 1/2	1 1/2	1 5/8	1 5/8	2 5/16	2 5/16	2 5/16

DIMENSIONS

Extra Heavy Cast Iron Tees (Continued)

250 Lbs. Steam Pressure

400 Lbs. Water Pressure

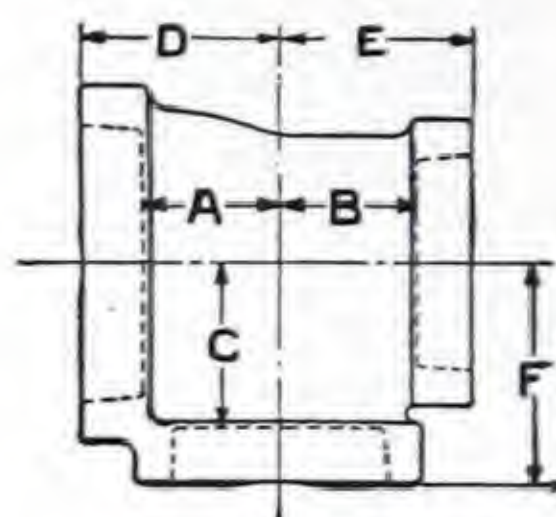
SIZE			DIMENSIONS					
			A	B	C	D	E	F
2	$3/4$	2	$1\frac{3}{4}$	$1\frac{9}{16}$	$1\frac{3}{4}$	$2\frac{1}{2}$	$2\frac{1}{8}$	$2\frac{1}{2}$
$1\frac{1}{2}$	$1\frac{1}{2}$	2	$1\frac{5}{8}$	$1\frac{5}{8}$	$1\frac{1}{2}$	$2\frac{5}{16}$	$2\frac{5}{16}$	$2\frac{5}{16}$
$1\frac{1}{2}$	$1\frac{1}{4}$	2	$1\frac{5}{8}$	$1\frac{5}{8}$	$1\frac{1}{2}$	$2\frac{5}{16}$	$2\frac{5}{16}$	$2\frac{5}{16}$
$1\frac{1}{2}$	1	2	$1\frac{5}{8}$	$1\frac{11}{16}$	$1\frac{1}{2}$	$2\frac{5}{16}$	$2\frac{5}{16}$	$2\frac{5}{16}$
$1\frac{1}{2}$	$3/4$	2	$1\frac{5}{8}$	$1\frac{3}{4}$	$1\frac{1}{2}$	$2\frac{5}{16}$	$2\frac{5}{16}$	$2\frac{5}{16}$
$1\frac{1}{4}$	$1\frac{1}{4}$	2	$1\frac{9}{16}$	$1\frac{9}{16}$	$1\frac{3}{8}$	$2\frac{1}{4}$	$2\frac{1}{4}$	$2\frac{3}{16}$
$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{1}{2}$	$1\frac{15}{16}$	$1\frac{15}{16}$	$1\frac{15}{16}$	$2\frac{15}{16}$	$2\frac{15}{16}$	$2\frac{15}{16}$
$2\frac{1}{2}$	$2\frac{1}{2}$	2	$1\frac{11}{16}$	$1\frac{11}{16}$	$2\frac{1}{16}$	$2\frac{11}{16}$	$2\frac{11}{16}$	$2\frac{7}{8}$
$2\frac{1}{2}$	$2\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{7}{16}$	$1\frac{7}{16}$	$1\frac{15}{16}$	$2\frac{7}{16}$	$2\frac{7}{16}$	$2\frac{5}{8}$
$2\frac{1}{2}$	$2\frac{1}{2}$	$1\frac{1}{4}$	$1\frac{5}{16}$	$1\frac{5}{16}$	$1\frac{7}{8}$	$2\frac{5}{16}$	$2\frac{5}{16}$	$2\frac{9}{16}$
$2\frac{1}{2}$	$2\frac{1}{2}$	1	$1\frac{1}{8}$	$1\frac{1}{8}$	$1\frac{13}{16}$	$2\frac{3}{16}$	$2\frac{3}{16}$	$2\frac{7}{16}$
$2\frac{1}{2}$	2	$2\frac{1}{2}$	$1\frac{15}{16}$	$2\frac{3}{16}$	$1\frac{15}{16}$	$2\frac{15}{16}$	$2\frac{15}{16}$	$2\frac{15}{16}$
$2\frac{1}{2}$	2	2	$1\frac{11}{16}$	$1\frac{3}{4}$	$2\frac{1}{16}$	$2\frac{11}{16}$	$2\frac{1}{2}$	$2\frac{7}{8}$
$2\frac{1}{2}$	2	1	$1\frac{1}{8}$	$1\frac{3}{8}$	$1\frac{13}{16}$	$2\frac{3}{16}$	$2\frac{3}{16}$	$2\frac{7}{16}$
$2\frac{1}{2}$	2	$1\frac{1}{2}$	$1\frac{1}{8}$	$1\frac{3}{8}$	$1\frac{15}{16}$	$2\frac{3}{16}$	$2\frac{3}{16}$	$2\frac{7}{16}$
$2\frac{1}{2}$	1	$2\frac{1}{2}$	$1\frac{15}{16}$	$2\frac{5}{16}$	$1\frac{15}{16}$	$2\frac{15}{16}$	$2\frac{15}{16}$	$2\frac{15}{16}$
$2\frac{1}{2}$	$3/4$	$2\frac{1}{2}$	$1\frac{15}{16}$	$2\frac{3}{8}$	$1\frac{15}{16}$	$2\frac{15}{16}$	$2\frac{15}{16}$	$2\frac{15}{16}$
2	2	$2\frac{1}{2}$	$2\frac{1}{16}$	$2\frac{1}{16}$	$1\frac{11}{16}$	$2\frac{7}{8}$	$2\frac{7}{8}$	$2\frac{11}{16}$
2	$1\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{1}{16}$	$2\frac{1}{8}$	$1\frac{11}{16}$	$2\frac{7}{8}$	$2\frac{7}{8}$	$2\frac{11}{16}$
$1\frac{1}{2}$	$1\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{1}{8}$	$2\frac{1}{8}$	$1\frac{11}{16}$	$2\frac{7}{8}$	$2\frac{7}{8}$	$2\frac{11}{16}$
3	3	3	$2\frac{5}{16}$	$2\frac{5}{16}$	$2\frac{5}{16}$	$3\frac{3}{8}$	$3\frac{3}{8}$	$3\frac{3}{8}$
3	3	$2\frac{1}{2}$	$2\frac{5}{16}$	$2\frac{5}{16}$	$2\frac{3}{8}$	$3\frac{3}{8}$	$3\frac{3}{8}$	$3\frac{3}{8}$
3	3	2	$1\frac{3}{4}$	$1\frac{3}{4}$	$2\frac{7}{16}$	$2\frac{13}{16}$	$2\frac{13}{16}$	$3\frac{1}{4}$
3	3	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$2\frac{5}{16}$	$2\frac{9}{16}$	$2\frac{9}{16}$	3
3	3	$1\frac{1}{4}$	$1\frac{3}{8}$	$1\frac{3}{8}$	$2\frac{1}{4}$	$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{15}{16}$
3	3	1	$1\frac{3}{8}$	$1\frac{3}{8}$	$2\frac{5}{16}$	$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{15}{16}$
3	$2\frac{1}{2}$	$2\frac{1}{2}$	2	$1\frac{15}{16}$	$2\frac{5}{16}$	$3\frac{1}{16}$	$2\frac{15}{16}$	$3\frac{5}{16}$
3	$2\frac{1}{2}$	2	$1\frac{3}{4}$	$1\frac{13}{16}$	$2\frac{7}{16}$	$2\frac{13}{16}$	$2\frac{13}{16}$	$3\frac{1}{4}$
3	$2\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{9}{16}$	$2\frac{5}{16}$	$2\frac{9}{16}$	$2\frac{9}{16}$	3
3	2	$2\frac{1}{2}$	2	$2\frac{3}{16}$	$2\frac{5}{16}$	$3\frac{1}{16}$	$2\frac{15}{16}$	$3\frac{5}{16}$
$2\frac{1}{2}$	$2\frac{1}{2}$	3	$2\frac{5}{16}$	$2\frac{5}{16}$	2	$3\frac{5}{16}$	$3\frac{5}{16}$	$3\frac{1}{16}$
$3\frac{1}{2}$	$3\frac{1}{2}$	$3\frac{1}{2}$	$2\frac{5}{8}$	$2\frac{5}{8}$	$2\frac{5}{8}$	$3\frac{3}{4}$	$3\frac{3}{4}$	$3\frac{3}{4}$
$3\frac{1}{2}$	$3\frac{1}{2}$	2	$1\frac{13}{16}$	$1\frac{13}{16}$	$2\frac{11}{16}$	$2\frac{15}{16}$	$2\frac{15}{16}$	$3\frac{1}{2}$
$3\frac{1}{2}$	3	2	$1\frac{13}{16}$	$1\frac{7}{8}$	$2\frac{11}{16}$	$2\frac{15}{16}$	$2\frac{15}{16}$	$3\frac{1}{2}$
4	4	4	$2\frac{15}{16}$	$2\frac{15}{16}$	$2\frac{15}{16}$	$4\frac{1}{8}$	$4\frac{1}{8}$	$4\frac{1}{8}$
4	4	3	$2\frac{7}{16}$	$2\frac{7}{16}$	$2\frac{13}{16}$	$3\frac{5}{8}$	$3\frac{5}{8}$	$3\frac{15}{16}$
4	4	$2\frac{1}{2}$	$2\frac{7}{16}$	$2\frac{7}{16}$	$2\frac{7}{8}$	$3\frac{5}{8}$	$3\frac{5}{8}$	$3\frac{15}{16}$

DIMENSIONS

Extra Heavy Cast Iron Tees (Continued)

250 Lbs. Steam Pressure

400 Lbs. Water Pressure



Tees—Fig. Nos. 225, 226

Dimensions A, B and C = End of Pipe
 Dimensions D, E and F = Face of Fitting

SIZE			DIMENSIONS					
			A	B	C	D	E	F
4	4	2	$1\frac{7}{8}$	$1\frac{7}{8}$	3	$3\frac{1}{16}$	$3\frac{1}{16}$	$3\frac{3}{4}$
4	4	$1\frac{1}{2}$	$1\frac{7}{8}$	$1\frac{7}{8}$	$3\frac{1}{16}$	$3\frac{1}{16}$	$3\frac{1}{16}$	$3\frac{3}{4}$
4	4	$1\frac{1}{4}$	$1\frac{7}{8}$	$1\frac{7}{8}$	$3\frac{1}{16}$	$3\frac{1}{16}$	$3\frac{1}{16}$	$3\frac{3}{4}$
$4\frac{1}{2}$	$4\frac{1}{2}$	$4\frac{1}{2}$	$3\frac{3}{16}$	$3\frac{3}{16}$	$3\frac{3}{16}$	$4\frac{7}{16}$	$4\frac{7}{16}$	$4\frac{7}{16}$
5	5	5	$3\frac{9}{16}$	$3\frac{9}{16}$	$3\frac{9}{16}$	$4\frac{7}{8}$	$4\frac{7}{8}$	$4\frac{7}{8}$
5	5	4	$3\frac{9}{16}$	$3\frac{9}{16}$	$3\frac{11}{16}$	$4\frac{7}{8}$	$4\frac{7}{8}$	$4\frac{7}{8}$
5	5	3	$2\frac{1}{2}$	$2\frac{1}{2}$	$3\frac{7}{16}$	$3\frac{13}{16}$	$3\frac{13}{16}$	$4\frac{9}{16}$
5	5	$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{1}{2}$	$3\frac{1}{2}$	$3\frac{13}{16}$	$3\frac{13}{16}$	$4\frac{9}{16}$
5	5	2	$2\frac{1}{2}$	$2\frac{1}{2}$	$3\frac{3}{4}$	$3\frac{13}{16}$	$3\frac{13}{16}$	$4\frac{9}{16}$
6	6	6	$4\frac{1}{4}$	$4\frac{1}{4}$	$4\frac{1}{4}$	$5\frac{5}{8}$	$5\frac{5}{8}$	$5\frac{5}{8}$
6	6	4	$3\frac{3}{16}$	$3\frac{3}{16}$	$4\frac{1}{16}$	$4\frac{9}{16}$	$4\frac{9}{16}$	$5\frac{1}{4}$
6	6	$3\frac{1}{2}$	$3\frac{3}{16}$	$3\frac{3}{16}$	$4\frac{1}{8}$	$4\frac{9}{16}$	$4\frac{9}{16}$	$5\frac{1}{4}$
6	6	3	$3\frac{3}{16}$	$3\frac{3}{16}$	$4\frac{3}{16}$	$4\frac{9}{16}$	$4\frac{9}{16}$	$5\frac{1}{4}$
6	6	$2\frac{1}{2}$	$3\frac{3}{16}$	$3\frac{3}{16}$	$4\frac{1}{4}$	$4\frac{9}{16}$	$4\frac{9}{16}$	$5\frac{1}{4}$
6	6	2	$2\frac{1}{8}$	$2\frac{1}{8}$	$4\frac{1}{8}$	$3\frac{1}{2}$	$3\frac{1}{2}$	$4\frac{15}{16}$
7	7	7	$5\frac{5}{8}$	$5\frac{5}{8}$	$5\frac{5}{8}$	$7\frac{1}{16}$	$7\frac{1}{16}$	$7\frac{1}{16}$
8	8	8	$5\frac{9}{16}$	$5\frac{9}{16}$	$5\frac{9}{16}$	$7\frac{1}{16}$	$7\frac{1}{16}$	$7\frac{1}{16}$
8	8	6	$4\frac{9}{16}$	$4\frac{9}{16}$	$5\frac{1}{2}$	$6\frac{1}{16}$	$6\frac{1}{16}$	$6\frac{7}{8}$
8	8	4	$4\frac{9}{16}$	$4\frac{9}{16}$	$5\frac{11}{16}$	$6\frac{1}{16}$	$6\frac{1}{16}$	$6\frac{7}{8}$
10	10	10	7	7	7	$8\frac{5}{8}$	$8\frac{5}{8}$	$8\frac{5}{8}$
10	10	6	$4\frac{15}{16}$	$4\frac{15}{16}$	$6\frac{3}{4}$	$6\frac{9}{16}$	$6\frac{9}{16}$	$8\frac{1}{8}$
12	12	12	$8\frac{3}{16}$	$8\frac{3}{16}$	$8\frac{3}{16}$	$10\frac{1}{16}$	$10\frac{1}{16}$	$10\frac{1}{16}$
12	12	8	$6\frac{1}{8}$	$6\frac{1}{8}$	$8\frac{1}{16}$	8	8	$9\frac{9}{16}$

DIMENSIONS

Extra Heavy Cast Iron Crosses

250 Lbs. Steam Pressure

400 Lbs. Water Pressure

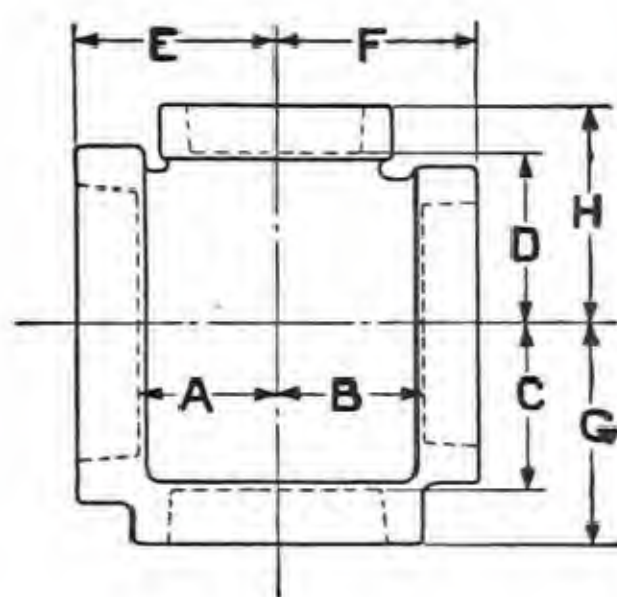


Fig. No. 427

Dimensions A, B, C and D = End of Pipe
 Dimensions E, F, G and H = Face of Fitting

SIZE				DIMENSIONS							
				A	B	C	D	E	F	G	H
$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$	$1\frac{1}{4}$	$1\frac{1}{4}$	$1\frac{1}{4}$	$1\frac{1}{4}$
$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{7}{8}$	$\frac{7}{8}$	$\frac{7}{8}$	$\frac{7}{8}$	$1\frac{7}{16}$	$1\frac{7}{16}$	$1\frac{7}{16}$	$1\frac{7}{16}$
1	1	1	1	1	1	1	1	$1\frac{5}{8}$	$1\frac{5}{8}$	$1\frac{5}{8}$	$1\frac{5}{8}$
$1\frac{1}{4}$	$1\frac{1}{4}$	$1\frac{1}{4}$	$1\frac{1}{4}$	$1\frac{1}{4}$	$1\frac{1}{4}$	$1\frac{1}{4}$	$1\frac{1}{4}$	$1\frac{15}{16}$	$1\frac{15}{16}$	$1\frac{15}{16}$	$1\frac{15}{16}$
$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{7}{16}$	$1\frac{7}{16}$	$1\frac{7}{16}$	$1\frac{7}{16}$	$2\frac{1}{8}$	$2\frac{1}{8}$	$2\frac{1}{8}$	$2\frac{1}{8}$
2	2	2	2	$1\frac{3}{4}$	$1\frac{3}{4}$	$1\frac{3}{4}$	$1\frac{3}{4}$	$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{1}{2}$
$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{1}{2}$	$1\frac{15}{16}$	$1\frac{15}{16}$	$1\frac{15}{16}$	$1\frac{15}{16}$	$2\frac{15}{16}$	$2\frac{15}{16}$	$2\frac{15}{16}$	$2\frac{15}{16}$
3	3	3	3	$2\frac{5}{16}$	$2\frac{5}{16}$	$2\frac{5}{16}$	$2\frac{5}{16}$	$3\frac{3}{8}$	$3\frac{3}{8}$	$3\frac{3}{8}$	$3\frac{3}{8}$
$3\frac{1}{2}$	$3\frac{1}{2}$	$3\frac{1}{2}$	$3\frac{1}{2}$	$2\frac{5}{8}$	$2\frac{5}{8}$	$2\frac{5}{8}$	$2\frac{5}{8}$	$3\frac{3}{4}$	$3\frac{3}{4}$	$3\frac{3}{4}$	$3\frac{3}{4}$
4	4	4	4	$2\frac{15}{16}$	$2\frac{15}{16}$	$2\frac{15}{16}$	$2\frac{15}{16}$	$4\frac{1}{8}$	$4\frac{1}{8}$	$4\frac{1}{8}$	$4\frac{1}{8}$
5	5	5	5	$3\frac{9}{16}$	$3\frac{9}{16}$	$3\frac{9}{16}$	$3\frac{9}{16}$	$4\frac{7}{8}$	$4\frac{7}{8}$	$4\frac{7}{8}$	$4\frac{7}{8}$
6	6	6	6	$4\frac{1}{4}$	$4\frac{1}{4}$	$4\frac{1}{4}$	$4\frac{1}{4}$	$5\frac{5}{8}$	$5\frac{5}{8}$	$5\frac{5}{8}$	$5\frac{5}{8}$
8	8	8	8	$5\frac{9}{16}$	$5\frac{9}{16}$	$5\frac{9}{16}$	$5\frac{9}{16}$	$7\frac{1}{16}$	$7\frac{1}{16}$	$7\frac{1}{16}$	$7\frac{1}{16}$
10	10	10	10	7	7	7	7	$8\frac{5}{8}$	$8\frac{5}{8}$	$8\frac{5}{8}$	$8\frac{5}{8}$
12	12	12	12	$8\frac{3}{16}$	$8\frac{3}{16}$	$8\frac{3}{16}$	$8\frac{3}{16}$	$10\frac{1}{16}$	$10\frac{1}{16}$	$10\frac{1}{16}$	$10\frac{1}{16}$

Dimensions for extra heavy reducing crosses on application.

CAST STEEL SCREWED FITTINGS

To Be Used For:

Superheated Steam Lines
Saturated Steam Lines
Hot Oil Lines (Tar Lines)
Continuous Still Lines
Vapor Lines
High Pressure Water Lines
High Pressure Oil Lines

High Pressure Air Lines
High Pressure Gas Lines
High Pressure Well Connections
High Temperature and
Pressure Oil Lines
General Service on Lines Subject
to Expansion and Contraction

300 Pound Cast Steel Screwed Fittings

For 300 Pounds Steam and any Total Temperature up to 750° F.,
 225 Pounds Oil or Vapor Pressure and Temperature up to 900° F.,
 800 Pounds Cold Oil, Gas or Water Working Pressure.



Elbow
Fig. No. 436



45° Elbow
Fig. No. 437



Tee
Fig. No. 438



Cross
Fig. No. 439

LIST PRICES

Size.....Inches	2	2½	3	3½
Elbow, Fig. No. 436.....Each	4.00	4.75	6.00	7.75
45° Elbow, Fig. No. 437.....Each	4.00	4.75	6.00	7.75
Tee, Fig. No. 438.....Each	6.00	7.10	9.00	11.50
Cross, Fig. No. 439.....Each	8.00	9.50	12.00	15.50
Size.....Inches	4	4½	5	6
Elbow, Fig. No. 436.....Each	8.50	11.75	13.50	16.50
45° Elbow, Fig. No. 437.....Each	8.50	11.75	13.50	16.50
Tee, Fig. No. 438.....Each	12.75	17.50	20.25	25.00
Cross, Fig. No. 439.....Each	17.00	23.50	27.00	33.00

Reducing Fittings made to order.

For sizes smaller than 2-inch use Forged Steel Fittings.

Tested to 800 pounds hydraulic pressure. Can be tested to 1500 pounds when so specified.

Order by Figure Number.

CAST STEEL SCREWED FITTINGS

600 Pound Cast Steel Screwed Fittings

For 600 Pounds Steam and any Total Temperature up to 750° F.,
475 Pounds Oil or Vapor Pressure and Temperature up to 900° F.,
2,000 Pounds Cold Oil, Gas or Water Working Pressure.



Elbow
Fig. No. 440



45° Elbow
Fig. No. 441



Tee
Fig. No. 442



Cross
Fig. No. 443

LIST PRICES

Size.....Inches	2	2½	3	3½
Elbow, Fig. No. 440.....Each	4.00	4.75	6.00	7.75
45° Elbow, Fig. No. 441.....Each	4.00	4.75	6.00	7.75
Tee, Fig. No. 442.....Each	6.00	7.10	9.00	11.50
Cross, Fig. No. 443.....Each	8.00	9.50	12.00	15.50

Size.....Inches	4	4½	5	6
Elbow, Fig. No. 440.....Each	8.50	11.75	13.50	16.50
45° Elbow, Fig. No. 441.....Each	8.50	11.75	13.50	16.50
Tee, Fig. No. 442.....Each	12.75	17.50	20.25	25.00
Cross, Fig. No. 443.....Each	17.00	23.50	27.00	33.00

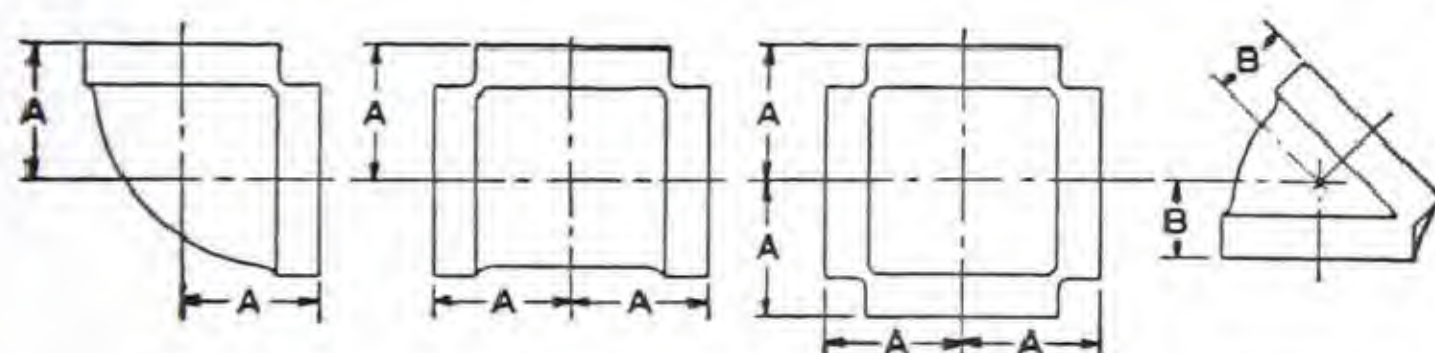
Tested to 1500 pounds hydraulic pressure. Can be tested to 2500 pounds when so specified.

Reducing Fittings made to order.

For sizes smaller than 2-inch, use Forged Steel Fittings.

DIMENSIONS

300 and 600 Pound Cast Steel Screwed Fittings



Elbow

Tee

Cross

45° Elbow

DIMENSIONS—300 POUND STANDARD

Size.....Inches	2	2½	3	3½	4	4½	5	6
A-C to F. Elbow, Tee, Cross.	2 15/16	3 3/8	3 3/4	4	4 3/8	4 5/8	5	5 3/4
B-C to F. 45° Elbow	2 3/16	2 1/2	2 3/4	2 7/8	3 1/8	3 1/4	3 1/2	3 7/8

DIMENSIONS—600 POUND STANDARD

Size.....Inches	2	2½	3	3½	4	4½	5	6
A-C to F. Elbow, Tee, Cross.	2 15/16	3 5/8	4	4 1/4	4 5/8	4 7/8	5 1/4	6
B-C to F. 45° Elbow	2 3/16	2 3/4	3	3 1/8	3 3/8	3 1/2	3 3/4	4 1/8

Order by Figure Number.

DROP FORGED STEEL FITTINGS 3000 Pound Hydraulic

*For Superheated Steam or Hot Oil Working Pressures up to 600 Pounds
and a Total Temperature of 800 Degrees Fahrenheit.*

*For Cold Water, Oil or Gas Working Pressures up to
3000 Pounds Hydrostatic.*



Elbow
Fig. No. 444



45° Elbow
Fig. No. 445



Tee
Fig. No. 446



Cross
Fig. No. 447

Size.....Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$
Elbow, Fig. No. 444.....Each	.55	.55	.65	.75	.90	1.20
45° Elbow, Fig. No. 445.....Each	.68	.68	.78	.90	1.08	1.44
Tee, Fig. No. 446.....Each	.80	.80	.95	1.10	1.35	1.75
Cross, Fig. No. 447.....Each	1.10	1.10	1.30	1.50	1.90	2.80

Size.....Inches	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4
Elbow, Fig. No. 444.....Each	1.50	1.90	2.90	5.00	12.50	12.50
45° Elbow, Fig. No. 445.....Each	1.80	2.28	3.48	6.00	14.00	14.00
Tee, Fig. No. 446.....Each	2.30	2.90	4.40	7.50	17.00	17.00
Cross, Fig. No. 447.....Each	3.50	5.00	7.30	10.00	23.00	23.00

10,000 Pounds Hydraulic

*For Superheated Steam or Hot Oil Working Pressures up to 1200 Pounds
and a Total Temperature of 900 Degrees Fahrenheit.*

*For Cold Water, Oil or Gas Working Pressures up to
10,000 Pounds Hydrostatic.*



Elbow
Fig. No. 448



45° Elbow
Fig. No. 449



Tee
Fig. No. 450



Cross
Fig. No. 451

Size.....Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$
Elbow, Fig. No. 448.....Each	.55	.65	.75	.90	1.20	1.50
45° Elbow, Fig. No. 449.....Each	.68	.78	.90	1.08	1.44	1.80
Tee, Fig. No. 450.....Each	.80	.95	1.10	1.35	1.75	2.30
Cross, Fig. No. 451.....Each	1.10	1.30	1.50	1.90	2.80	3.50

Size.....Inches	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4
Elbow, Fig. No. 448.....Each	1.90	2.90	5.00	12.50	12.50	....
45° Elbow, Fig. No. 449.....Each	2.28	3.48	6.00	14.00	14.00	....
Tee, Fig. No. 450.....Each	2.90	4.40	7.50	17.00	17.00	....
Cross, Fig. No. 451.....Each	5.00	7.30	10.00	23.00	23.00	....

For reducing sizes, add 15% to above list prices.
Order by Figure Number.

DROP FORGED STEEL FITTINGS

*Elbows—Plugs—Caps—Couplings**3000-6000 Lbs. Cold Working Pressure*

Street Elbow—Fig. No. 452



Steel Plug—Fig. No. 453



Steel Cap—Fig. No. 454



Steel Couplings—Fig. Nos. 455, 456

STREET ELBOW—Fig. No. 452

3500 Pounds Cold Working Pressure

Size.....Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$
Price.....Each	.75	.85	.85	1.05	1.40	2.00

STEEL PLUGS—Fig. No. 453

Size.....Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$
Price.....Each	.25	.25	.25	.30	.35	.50
Size.....Inches	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4
Price.....Each	.75	1.50	3.00	5.00	5.75	6.50

STEEL CAPS—Fig. No. 454

Size.....Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Price.....Each	.35	.35	.45	.65	.90	1.00	1.30	2.00
Size.....Inches	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	5	6	7	8
Price.....Each	3.65	4.35	5.45	13.00	18.00	22.00	30.00	32.70

COUPLINGS—Fig. No. 455

3000 Pounds Cold Working Pressure

Size.....Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$
Straight.....Each	.40	.40	.40	.45	.55	.70
Reducing.....Each	....	.55	.70	1.00	1.20	1.35
Size.....Inches	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4
Straight.....Each	.85	1.15	1.60	2.75	3.85	4.80
Reducing.....Each	1.60	1.85	2.75	3.75	5.50	6.75

COUPLINGS—Fig. No. 456

6000 Pounds Cold Working Pressure

Size.....Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1
Straight.....Each	.60	.60	.60	.65	.85
Reducing.....Each	....	.75	.90	1.25	1.50
Size.....Inches	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Straight.....Each	1.05	1.30	1.75	2.40	4.75
Reducing.....Each	1.70	2.10	2.50	3.60	5.75

Order by Figure Number.

DROP FORGED STEEL FITTINGS

Steel Bushings



Hex Bushing
Fig. No. 457



Face Bushing
Fig. No. 458

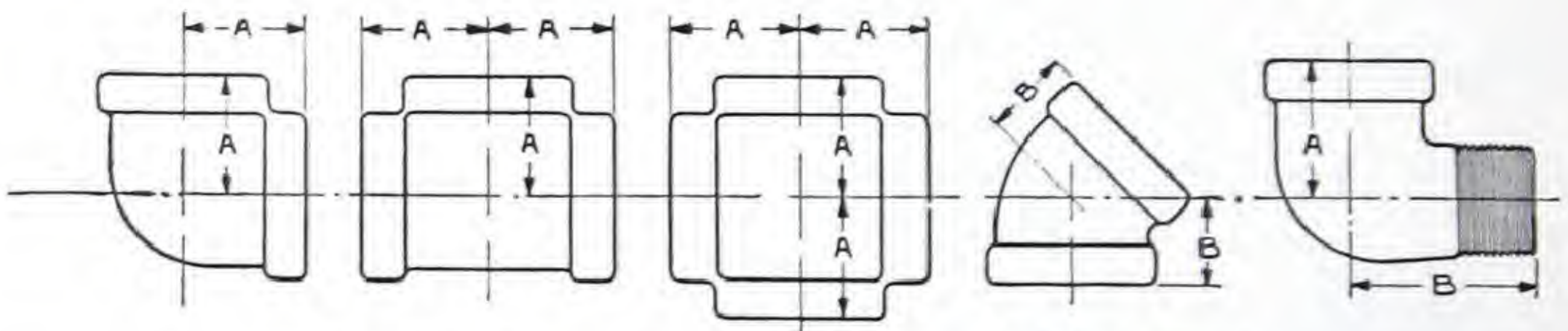
HEX BUSHINGS—Fig. No. 457

Size.....Inches	Price	Size.....Inches	Price	Size.....Inches	Price
$\frac{1}{2} \times \frac{3}{8}$ and less.....	\$0.45	$2 \times \frac{3}{4}$ and less.....	\$1.20	3×2 and more.....	\$8.00
$\frac{3}{4} \times \frac{1}{2}$ and less.....	.45	2×1 and more.....	1.32	$3 \frac{1}{2} \times 1 \frac{1}{2}$ and less...	8.25
$1 \times \frac{3}{4}$ and less.....	.50	$2 \frac{1}{2} \times 1 \frac{1}{4}$ and less...	4.50	$3 \frac{1}{2} \times 2$ and more.....	9.00
$1 \frac{1}{4} \times 1$ and less.....	.66	$2 \frac{1}{2} \times 1 \frac{1}{2}$ and more..	5.00	$4 \times 1 \frac{1}{2}$ and less.....	9.50
$1 \frac{1}{2} \times 1 \frac{1}{4}$ and less....	.83	$3 \times 1 \frac{1}{2}$ and less.....	7.25	4×2 and more.....	10.50

FACE BUSHINGS—Fig. No. 458

Size.....Inches	Price	Size.....Inches	Price	Size.....Inches	Price
$\frac{3}{8} \times \frac{1}{4}$	\$0.50	$1 \frac{1}{4} \times 1$ and less.....	\$0.75	$3 \times 2 \frac{1}{2}$ and less.....	\$5.00
$\frac{1}{2} \times \frac{3}{8}$ and less.....	.50	$1 \frac{1}{2} \times 1 \frac{1}{4}$ and less...	.95	$3 \frac{1}{2} \times 3$ and less.....	6.00
$\frac{3}{4} \times \frac{1}{2}$ and less.....	.55	$2 \times 1 \frac{1}{2}$ and less.....	1.50	$4 \times 3 \frac{1}{2}$ and less.....	7.50
$1 \times \frac{3}{4}$ and less.....	.60	$2 \frac{1}{2} \times 2$ and less.....	2.00	.....	.....

DIMENSIONS



For Working Pressures up to 3000 Pounds

Size.....Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1 \frac{1}{4}$	$1 \frac{1}{2}$	2	$2 \frac{1}{2}$	3	$3 \frac{1}{2}$	4
A—Center to Face.....Inches	$\frac{7}{8}$	$\frac{7}{8}$	$1 \frac{1}{4}$	$1 \frac{1}{2}$	$1 \frac{3}{4}$	2	$2 \frac{1}{4}$	$2 \frac{1}{2}$	$2 \frac{3}{4}$	$3 \frac{1}{2}$	$4 \frac{1}{4}$	$4 \frac{1}{4}$
B—Center to Face.....Inches	$\frac{5}{8}$	$\frac{5}{8}$	$\frac{7}{8}$	1	$1 \frac{3}{8}$	$1 \frac{1}{2}$	$1 \frac{7}{8}$	$1 \frac{3}{4}$	$2 \frac{1}{8}$	$2 \frac{5}{8}$	$3 \frac{1}{4}$	$3 \frac{1}{4}$

For Working Pressures up to 10,000 Pounds

Size.....Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1 \frac{1}{4}$	$1 \frac{1}{2}$	2	$2 \frac{1}{2}$	3	$3 \frac{1}{2}$	
A—Center to Face.....Inches	$1 \frac{1}{8}$	$1 \frac{1}{4}$	$1 \frac{1}{2}$	$1 \frac{3}{4}$	2	$2 \frac{1}{4}$	$2 \frac{1}{2}$	$2 \frac{3}{4}$	$3 \frac{1}{2}$	$4 \frac{1}{4}$	$4 \frac{1}{4}$	
B—Center to Face.....Inches	$\frac{5}{8}$	$\frac{7}{8}$	1	$1 \frac{3}{8}$	$1 \frac{1}{2}$	$1 \frac{7}{8}$	$1 \frac{3}{4}$	$2 \frac{1}{8}$	$2 \frac{5}{8}$	$3 \frac{1}{4}$	$3 \frac{1}{4}$	

STREET ELBOWS—For Working Pressures up to 3500 Pounds

Size.....Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1 \frac{1}{4}$
A—Center to Face.....Inches	$\frac{7}{8}$	1	$1 \frac{1}{8}$	$1 \frac{3}{8}$	$1 \frac{3}{4}$	2
B—Center to End.....Inches	$1 \frac{1}{4}$	$1 \frac{1}{2}$	$1 \frac{5}{8}$	$1 \frac{7}{8}$	$2 \frac{1}{4}$	$2 \frac{5}{8}$

Reducing Fittings are bored from Solid Forgings and carry same dimensions as largest opening.

Order by Figure Number.

FLOOR AND CEILING PLATES

Cast Iron Plates and Sockets

Ceiling Plate
Fig. No. 395Floor Plate
Fig. No. 396Floor Socket
Fig. No. 397Split Floor Socket
Fig. No. 398

CEILING PLATES — Fig. No. 395

Size.	Inches	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2
Price	Each	.11	.13	.16	.18	.23	.27	.36	.50	.55
Size.	Inches	4	4 1/2	5	6	7	8	10	12	
Price	Each	.68	.85	.95	1.25	2.00	2.50	3.00	3.50	

FLOOR PLATES — Fig. No. 396

Size.	Inches	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2
Price	Each	.06	.06	.06	.06	.08	.11	.14	.16	.24
Size.	Inches	3	3 1/2	4	5	6	7	8	10	12
Price	Each	.30	.35	.42	.60	.75	1.50	1.75	2.50	3.00

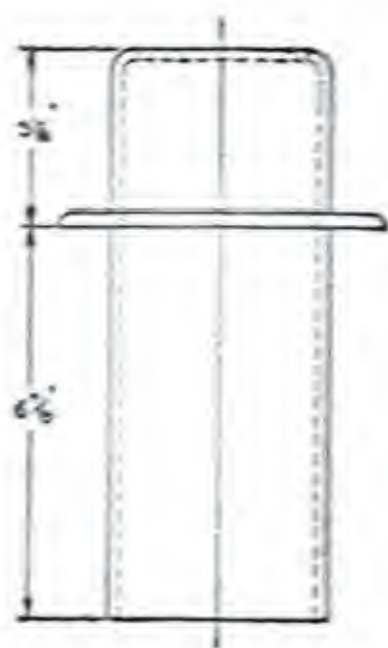
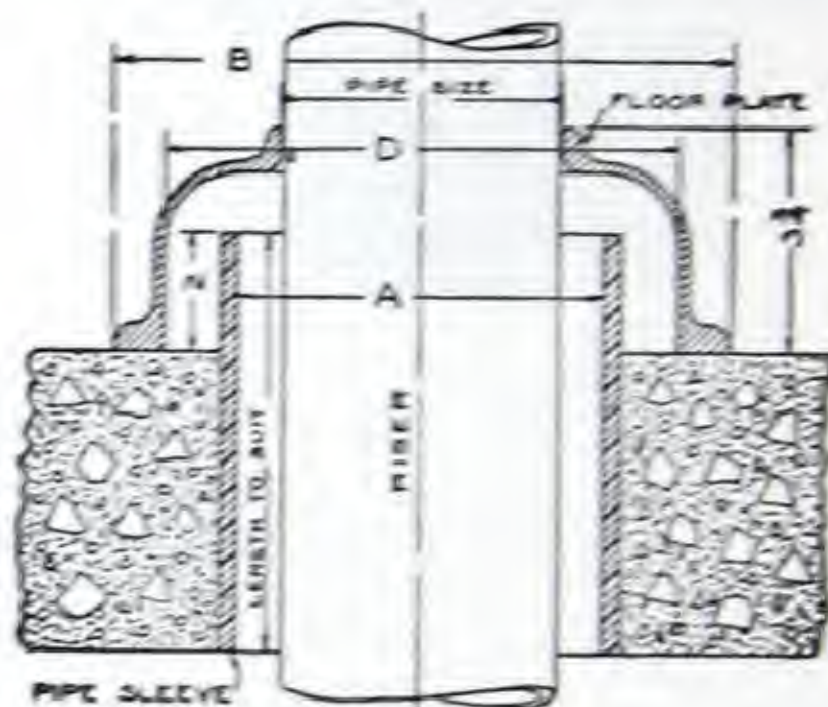
FLOOR SOCKETS — Fig. Nos. 397, 398

Size.	Inches	3/8	1/2	3/4	1	1 1/4	1 1/2	2		
Fig. No. 397	Each	.06	.06	.06	.08	.11	.14	.16		
Fig. No. 398	Each	.06	.06	.06	.08	.11	.14	.16		
Size.	Inches	2 1/2	3	3 1/2	4	5	6	8		
Fig. No. 397	Each	.24	.30	.35	.42	.60	.75	1.75		
Fig. No. 398	Each	.24	.30	.35	.42	.60	.75	1.75		

For galvanized, double above lists.
Order by Figure Number.

FLOOR AND CEILING PLATES

Cast Iron Plates and Sockets

Concrete Floor Socket
Fig. No. 399Special Concrete Floor Plate
Fig. No. 400Dimensions of
Concrete Floor SocketIllustrating the application of
Special Concrete Floor Plate

CONCRETE FLOOR SOCKET—Fig. No. 399

Size.....Inches	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Price.....Each	.50	.60	.70	.80	1.00	1.10	1.40
Size.....Inches	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	5	6	8
Price.....Each	1.50	1.85	1.90	2.20	3.80	4.00	4.75

SPECIAL CONCRETE FLOOR PLATE—Fig. No. 400

Size.....Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$
Price.....Each	.50	.60	.70	.80	.90	1.00	1.10
Dimension A.....Inches	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	$2\frac{1}{2}$	3	$3\frac{1}{2}$
Dimension B.....Inches	$4\frac{1}{4}$	$4\frac{1}{2}$	$5\frac{1}{8}$	$5\frac{3}{4}$	$5\frac{3}{4}$	$6\frac{1}{4}$	$6\frac{3}{4}$
Dimension D.....Inches	$2\frac{1}{2}$	$2\frac{3}{4}$	$3\frac{3}{8}$	4	4	$4\frac{1}{2}$	5
Size.....Inches	3	$3\frac{1}{2}$	4	5	6	8	10
Price.....Each	1.20	1.50	1.90	2.10	2.20	3.50	3.70
Dimension A.....Inches	4	5	6	7	8	10	12
Dimension B.....Inches	7	$8\frac{5}{8}$	$10\frac{1}{4}$	$11\frac{1}{8}$	12	$14\frac{1}{4}$	$16\frac{1}{8}$
Dimension D.....Inches	$5\frac{1}{4}$	$6\frac{7}{8}$	$8\frac{1}{2}$	$9\frac{3}{8}$	$10\frac{1}{4}$	$12\frac{1}{2}$	$14\frac{3}{8}$

For galvanized, double above lists.
Order by Figure Number.

FLOOR AND CEILING PLATES

Beaton's Floor and Ceiling Plates

Floor and Ceiling Plate
Fig. No. 3



Floor and Ceiling Plate
Fig. No. 10

FLOOR AND CEILING PLATE—Fig. No. 3

Size.....Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Black.....Each	.14	.15	.16	.17	.20	.22	.25	.30	.50	.65
Nickel Plated.....Each	.25	.26	.27	.28	.32	.35	.38	.45	.65	.80
Brass Polished or Nickel Plated } ..Each	1.00	1.00	1.00	1.20	1.30	1.60	1.80	2.00	2.50	3.00

Size.....Inches	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	6	7	8	9	10	....
Black.....Each	.80	1.00	1.25	1.50	1.75	2.00	2.25	2.50	2.75	....
Nickel Plated.....Each	1.00	1.25	1.50	1.75	2.00	2.25	2.50	2.75	3.00	....
Brass Polished or Nickel Plated } ..Each	4.00	5.00	6.00	7.00	9.00	10.00	12.00	14.00	16.00	....

FLOOR AND CEILING PLATE—Fig. No. 10

Size.....Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$
Black.....Each	.14	.15	.16	.17	.20	.22
Nickel Plated.....Each	.25	.26	.27	.28	.32	.35
Brass Polished or Nickel Plated } ..Each	.58	.60	.62	.65	.72	.80

Size.....Inches	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4
Black.....Each	.25	.30	.50	.65	.80	1.00
Nickel Plated.....Each	.38	.45	.65	.80	1.00	1.25
Brass Polished or Nickel Plated } ..Each	.85	1.00	1.50	1.80	2.25	2.75

The Fig. No. 3 Combination Floor and Ceiling Plate is furnished in black or nickel plated cast iron, or polished or nickel plated brass.

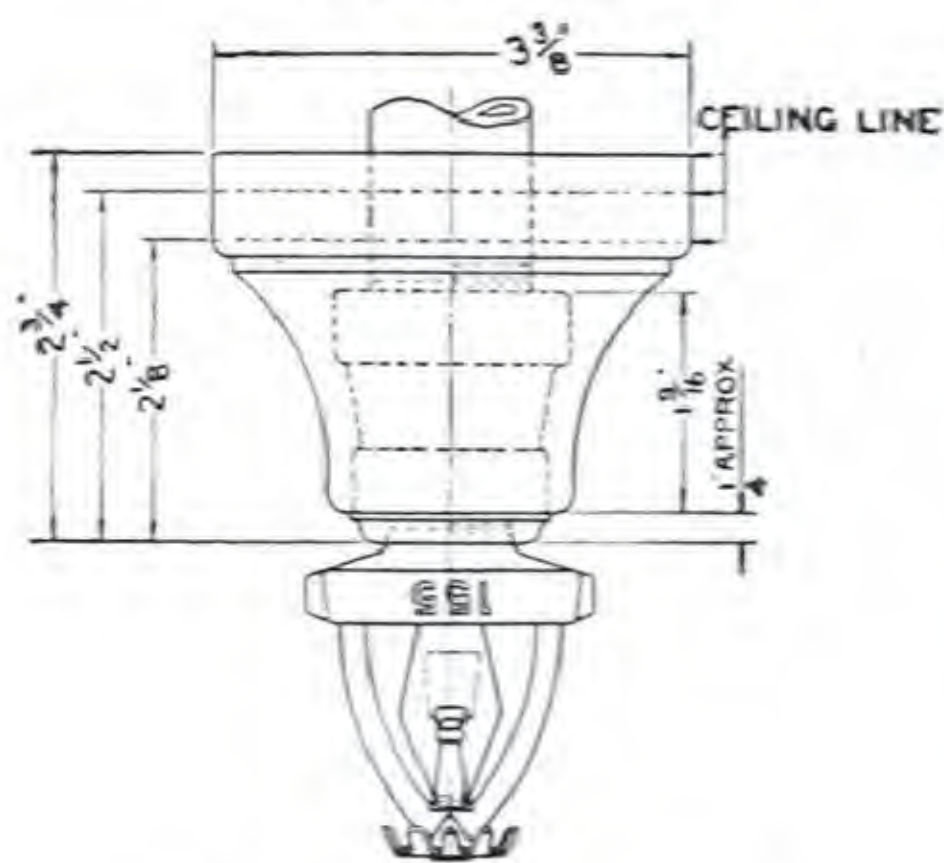
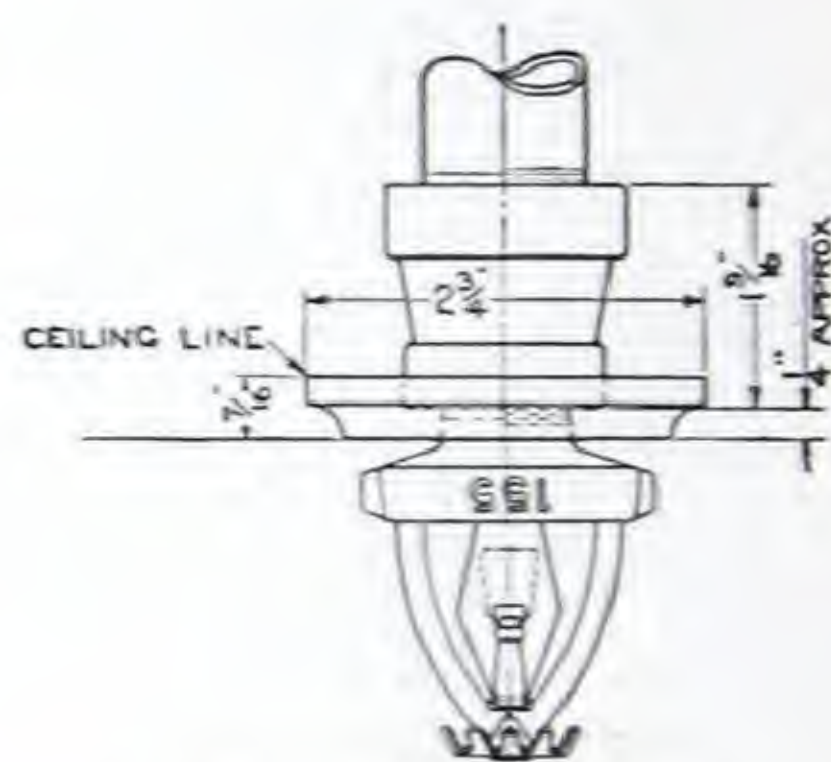
The Fig. No. 10 Combination Floor and Ceiling Plate is made of cold rolled steel and can be furnished in polished or nickel plated brass. The Fig. No. 10 can also be furnished in white enamel finish suitable for use with tile floors and walls, white ceilings or other places where white finish is desirable.

Order by Figure Number.

FLOOR AND CEILING PLATES

Stamped Brass Ceiling Plates

For Sprinkler Work

Standard Pattern
Fig. No. 401Special Pattern
Fig. No. 402Showing Application of
Standard PatternShowing Application of
Special Pattern

These ceiling plates are furnished either Unfinished or Finished, Polished and Lacquered.

Can also be furnished Nickel Plated to order at a special price.

They are made in 1/2-inch size only.

The Fig. No. 401 is made in three depths as given above.

STANDARD PATTERN—Fig. No. 401

Price Each, Unfinished.....	\$.30
Price Each, Finished, Polished, and Lacquered.....	.45

SPECIAL PATTERN—Fig. No. 402

Price Each, Unfinished.....	\$.20
Price Each, Finished, Polished and Lacquered.....	.35

Furnished Unfinished unless otherwise specified.

Order by Figure Number.

UNIONS



Rex Union
Malleable Iron
 Brass-to-Iron Seat
 250 Lbs. Steam Pressure
 Fig. No. 459-C

Size..... Inches	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1
Price, Black..... Each	.30	.30	.40	.50	.60	.80
Price, Galvanized..... Each	.45	.45	.60	.75	.90	1.20

Size..... Inches	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	
Price, Black..... Each	1.20	1.60	2.00	3.20	4.80	..
Price, Galvanized..... Each	1.80	2.40	3.00	4.80	6.20	..



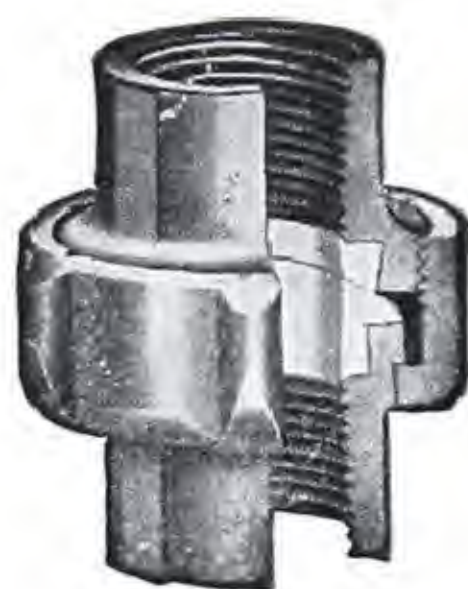
Dart Union
Malleable Iron
 Two Bronze Seats
 300 Lbs. Steam Pressure
 Fig. No. 462

Size..... Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1
Price, Black..... Each	.30	.40	.50	.60	.80
Price, Galvanized..... Each	.39	.52	.65	.78	1.04

Size..... Inches	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Price, Black..... Each	1.20	1.60	2.00	3.20	4.80
Price, Galvanized..... Each	1.56	2.08	2.60	4.16	6.24

Order by Figure Number.

UNIONS



Rockwood Union
Sheradized Pressed Steel
250 Lbs. Steam Pressure

Ground Bronze Seats
Fig. No. 464

Ground Monel Metal Seats
Fig. No. 465

Size.....Inches	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3
Fig. No. 464 .....Each	.30	.40	.50	.60	.80	1.20	1.60	2.00	3.20	4.80
Fig. No. 465.....Each	.80	1.00	1.20	1.40	1.80	2.70	3.60	4.50	.....	.....



Catawissa Union
Forged Steel

Solid Steel Seat
Standard—Fig. No. 466
Extra Heavy—Fig. No. 467

Brass Seat
Standard—Fig. No. 468
Extra Heavy—Fig. No. 469

Monel Metal Seat
Standard—Fig. No. 468-A
Extra Heavy—Fig. No. 469-A

Standard for Cold Working Pressures up to 2000 Lbs.

Extra Heavy for Cold Working Pressures up to 6000 Lbs.

Standard for 500 Lbs. Steam Working Pressure.

Extra Heavy, when fitted with Monel Metal Seats for highest pressures and temperatures at which steam is used.

Size.....Inches	1/8	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2
Fig. Nos. 466, 468...Black, Each	.30	.30	.40	.50	.60	.80	1.20	1.60	2.00
Fig. Nos. 466, 468...Galv., Each	.45	.45	.60	.75	.90	1.20	1.80	2.40	3.00
Fig Nos. 467, 469, 468-A, 469-A Black, Each	.90	.90	1.20	1.50	1.80	2.40	3.60	4.80	6.00

Order by Figure Number.

UNIONS

**Gasket Type**

150 Lbs. Steam Pressure

Malleable Union

Female—Fig. No. 470

Malleable Union

Male and Female (Not Illustrated)

Fig. No. 471

FEMALE—Fig. No. 470

Size.....Inches	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$
Price, Black.....Each	.18	.18	.20	.22	.27	.33	.46
Price, Galvanized.....Each	.27	.27	.30	.33	.40	.50	.70

Size.....Inches	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	..
Price, Black.....Each	.58	.75	1.55	2.10	3.65	4.35	..
Price, Galvanized.....Each	.90	1.15	2.35	3.15	5.50	6.50	..

MALE AND FEMALE—Fig. No. 471

Size.....Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$
Price, Black.....Each	.23	.25	.28	.33	.40	.57	.72	.95	1.95
Price, Galvanized.....Each	.32	.35	.39	.46	.57	.81	1.04	1.35	2.75

**Ground Joint Type**

300 Lbs. Steam Pressure

Dart Male and Female Union

Fig. No. 472

DART, MALE AND FEMALE UNION—Fig. No. 472

Size.....Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Price, Black.....Each	.38	.50	.62	.75	1.00	1.50	2.00	2.50	4.00	6.00

For Galvanized, add 30%.
Order by Figure Number.

UNIONS

Union Fittings

Gasket Type

150 Lbs. Steam Pressure



Elbow, Female Union—Fig. No. 474

Elbow, Male Union (Not Illustrated)—Fig. No. 475

Size.....Inches	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$
Fig. No. 474, Black....	.40	.42	.54	.63	.90	1.05	1.55	2.85
Fig. No. 474, Galv....	.60	.63	.81	.95	1.35	1.58	2.35	4.30
Fig. No. 475, Black....	.45	.48	.62	.72	1.05	1.20	1.80	3.30
Fig. No. 475, Galv....	.70	.72	.93	1.08	1.60	1.80	2.70	4.95



Tee, Female Union—Fig. No. 476

Tee, Male Union (Not Illustrated)—Fig. No. 477

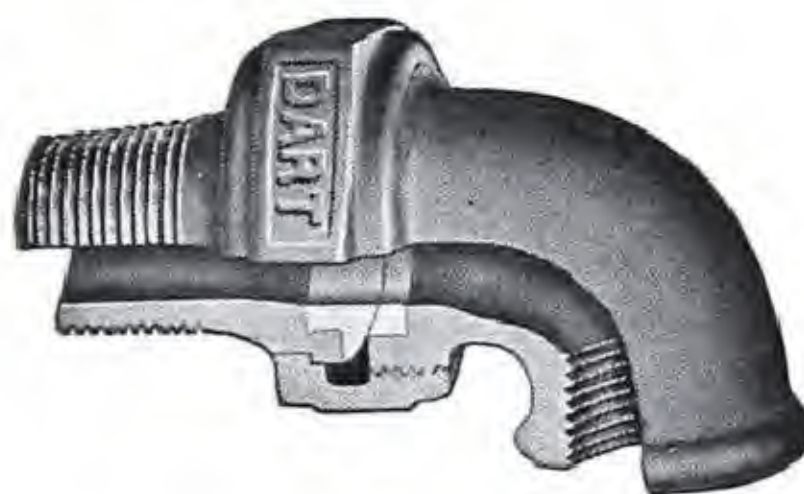
Size.....Inches	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$
Fig. No. 476, Black....	.43	.45	.57	.70	.95	1.15	1.70	3.20
Fig. No. 476, Galv....	.65	.68	.86	1.05	1.45	1.75	2.55	4.80
Fig. No. 477, Black....	.50	.52	.65	.80	1.10	1.30	1.95	3.70
Fig. No. 477, Galv....	.75	.78	1.00	1.20	1.65	1.95	2.95	5.55

Order by Figure Number.

UNIONS
Union Fittings
Ground Joint Type
 For Steam, Gas, Water or Air
 300 Lbs. Steam Pressure



Elbow, Female Union
 Fig. No. 478



Elbow, Male Union
 Fig. No. 479

LIST PRICES—Fig. Nos. 478, 479

Size.....Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$
Price, Black.....Each	.45	.60	.75	.90
Size.....Inches	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Price, Black.....Each	1.20	1.80	2.40	3.00



Tee, Union on Outlet
 Female Union—Fig. No. 480
 Male Union—Fig. No. 481



Tee, Union on Run
 Female Union—Fig. No. 482
 Male Union—Fig. No. 483

LIST PRICES—Fig. Nos. 480, 481, 482, 483

Size.....Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$
Price, Black.....Each	.50	.66	.82	.99
Size.....Inches	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Price, Black.....Each	1.32	1.98	2.64	3.30

For Galvanized, add 30%.
 Order by Figure Number.

UNIONS

**Grinnell Brass Union***Round Ends**Ground Joint**125 Lbs. Steam Pressure**Fig. No. 484*

Furnished Semi-Finished unless otherwise specified.
 Polished and Nickel Plated to order only.
 *Made to order only.

Size.....Inches	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$*3\frac{1}{2}$	*4
Rough.....Each	.40	.50	.65	.85	1.15	1.60	2.25	2.70	4.00	7.50	11.50	22.50	30.00
Semi-Finished Each	.45	.55	.75	.95	1.30	1.75	2.50	3.00	4.50	8.25	12.75	25.00	33.00
Finished.....Each	.50	.60	.85	1.05	1.40	1.90	2.75	3.25	5.00	9.00	14.00	25.00	33.00

**Grinnell Brass Union***Octagon Pattern**Heavy—Ground Joint**200 Lbs. Steam Pressure**Fig. No. 485*

*Made to order only.

Size.....Inches	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$*2\frac{1}{2}$	*3	$*3\frac{1}{2}$	*4
Rough.....Each	.60	.65	.85	1.10	1.50	2.00	2.80	3.60	5.25	9.00	14.00	22.50	30.00

**Extra Heavy Brass Union***Round Ends**Ground Joint**250 Lbs. Steam Pressure**Fig. No. 486*

Size.....Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Semi-Finished.....Each	1.10	1.40	1.60	1.85	3.00	4.00	5.25	7.50	10.00	15.00

Order by Figure Number.

UNIONS

Standard Cast Iron Flanged Union

125 Lbs. Steam Pressure

Standard Flange Union
Fig. No. 487

Size.....Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$
Price, Black.....Each	.40	.46	.52	.64	.78	1.00	1.25	1.50	1.80
Price, Galvanized, Each	.80	.92	1.04	1.28	1.56	2.00	2.50	3.00	3.60
Diam. of Flanges, Inches	$2\frac{15}{16}$	3	$3\frac{1}{4}$	$4\frac{3}{16}$	$4\frac{3}{8}$	5	$5\frac{5}{8}$	$6\frac{3}{8}$	$6\frac{7}{8}$
No. of Bolts.....	3	3	3	4	4	4	4	4	4

Size.....Inches	4	$4\frac{1}{2}$	5	6	7	8	9	10	12
Price, Black.....Each	2.10	2.70	3.15	3.95	5.50	7.00	10.00	11.50	16.00
Price, Galvanized, Each	4.20	5.40	6.30	7.90	11.00	14.00	20.00	23.00	32.00
Diam. of Flanges, Inches	$7\frac{11}{16}$	$8\frac{5}{16}$	$8\frac{15}{16}$	$10\frac{1}{4}$	$11\frac{3}{4}$	$12\frac{5}{16}$	$14\frac{3}{16}$	$15\frac{5}{8}$	18
No. of Bolts.....	5	5	5	6	7	8	9	10	12

Extra Heavy Cast Iron Flange Union

250 Lbs. Steam Pressure

Extra Heavy Flange Union
Fig. No. 488

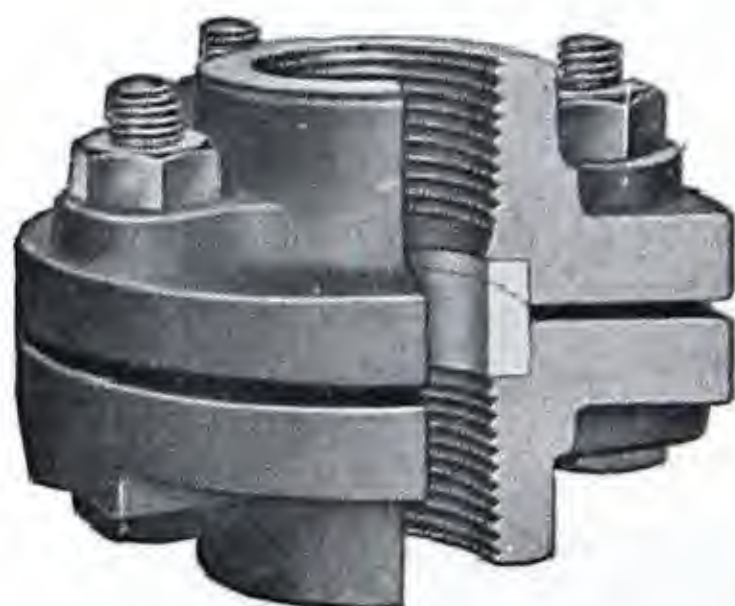
Size.....Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$
Price.....Each	.70	.70	.80	1.00	1.15	1.50	1.90	2.25	2.70
Diam. of Flanges, Inches	$3\frac{1}{4}$	$3\frac{1}{4}$	$3\frac{5}{8}$	$4\frac{1}{4}$	$4\frac{5}{8}$	$5\frac{3}{8}$	6	$6\frac{3}{4}$	$7\frac{1}{2}$
No. of Bolts.....	4	4	4	4	4	5	5	6	6

Size.....Inches	4	$4\frac{1}{2}$	5	6	7	8	9	10	12
Price.....Each	3.15	4.00	4.75	6.00	8.25	10.50	15.00	17.25	24.00
Diam. of Flanges, Inches	8	$8\frac{3}{4}$	$9\frac{3}{8}$	$10\frac{7}{8}$	12	$13\frac{1}{4}$	$14\frac{5}{8}$	$15\frac{3}{4}$	18
No. of Bolts.....	7	8	8	9	10	10	11	12	14

Flanged Unions are furnished without Gaskets. When specified Gaskets will be furnished at an extra price.

Order by Figure Number.

UNIONS

*Dart Cast Iron Flange Union**Bronze to Bronze Ground Joint**Standard for 300 Lbs. Saturated Steam Pressure*

Standard—Fig. No. 491

LIST PRICES—Fig. No. 491

Size.....Inches	1	1¼	1½	2	2½	3	3½
Price, Black.....Each	.80	1.20	1.60	2.00	3.20	4.80	6.00
Size.....Inches	4	4½	5	6	7	8	
Price, Black.....Each	7.50	8.75	10.00	12.50	15.00	18.00	.....

For Galvanized, add 30%.
Order by Figure Number.

UNIONS

Standard Brass Flange Union

125 Lbs. Steam Pressure

Standard Flange Union
Fig. No. 493

Size.....Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Price.....Each	4.00	4.50	5.00	5.50	7.00	9.00
Diam. of Flanges.....Inches	$2\frac{5}{16}$	3	$3\frac{1}{4}$	$4\frac{3}{16}$	$4\frac{3}{8}$	5
Number of Bolts.....	3	3	3	4	4	4

Size.....Inches	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	5	6
Price.....Each	11.50	15.00	18.00	22.00	35.00	45.00
Diam. of Flanges.....Inches	$5\frac{5}{8}$	$6\frac{3}{8}$	$6\frac{7}{8}$	$7\frac{1}{16}$	$8\frac{5}{16}$	$10\frac{1}{4}$
Number of Bolts.....	4	4	4	4	5	6

Extra Heavy Brass Flange Union

250 Lbs. Steam Pressure

Extra Heavy Flange Union
Fig. No. 494

Size.....Inches	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$
Price.....Each	7.50	8.50	11.00	13.00	16.00	18.00
Diam. of Flanges.....Inches	$3\frac{1}{4}$	$3\frac{5}{8}$	$4\frac{1}{4}$	$4\frac{5}{8}$	$5\frac{3}{8}$	6
Number of Bolts.....	4	4	4	4	5	5

Size.....Inches	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	6
Price.....Each	24.00	27.00	30.00	37.00	48.00	60.00
Diam. of Flanges.....Inches	$6\frac{3}{4}$	$7\frac{1}{2}$	8	$8\frac{3}{4}$	$9\frac{3}{8}$	$10\frac{7}{8}$
Number of Bolts.....	6	6	7	8	8	9

Made from Standard or Extra Heavy Cast Iron Patterns and furnished with Iron Bolts. Flange Unions are furnished without Gaskets. When specified, Gaskets will be furnished at an extra price.

Order by Figure Number.

UNIONS

*Drop Forged Steel Flange Unions**Tongue and Groove Faces*

Oval



Square



Round

LIST PRICES

Size	500 Pounds Cold Working Pressure Fig. No. 495		1500 Pounds Cold Working Pressure Fig. No. 496		2500 Pounds Cold Working Pressure Fig. No. 497		4000 Pounds Cold Working Pressure Fig. No. 498		6000 Pounds Cold Working Pressure Fig. No. 499	
	Shape	List Prices	Shape	List Prices	Shape	List Prices	Shape	List Prices	Shape	List Prices
$\frac{1}{4}$	Oval	1.00	Oval	1.00	Oval	1.00	Oval	3.80	Oval	3.80
$\frac{3}{8}$	"	1.00	"	1.00	"	1.00	"	3.80	"	3.80
$\frac{1}{2}$	"	1.20	"	1.20	"	1.20	"	3.80	"	3.80
$\frac{3}{4}$	"	1.60	"	1.60	"	1.60	"	4.60	"	4.80
1	"	1.80	"	1.80	"	1.90	"	5.40	"	5.60
$1\frac{1}{4}$	Square	2.45	Square	2.45	Square	3.00	Square	7.20	Square	7.60
$1\frac{1}{2}$	"	2.95	"	2.95	"	3.50	"	8.00	"	8.40
2	"	3.60	"	4.20	"	10.00	"	10.50	Round	14.00
$2\frac{1}{2}$	"	5.00	"	5.60	"	17.00	"	21.00	"	24.00
3	"	6.00	Round	18.00	....	....	....	....	....	....
$3\frac{1}{2}$	"	8.00	"	20.00	....	....	....	....	....	....
4	Round	11.00	"	26.00	....	....	....	....	....	....
5	"	14.00	....	....	....	....	....	....	....	....
6	"	20.00	....	....	....	....	....	....	....	....
8	"	32.90	....	....	....	....	....	....	....	....

A Flange "Union" or a "pair" of flanges consists of one tongue and one groove flange, the necessary bolts and a gasket.

Order by Figure Number.

GRINNELL MALLEABLE IRON FITTINGS

Standard Malleable Iron Flat Band Screwed Fittings

For Steam Working Pressures up to 150 Lbs.

On the following pages we illustrate the complete line of Grinnell Malleable Iron Fittings. These fittings are well proportioned and suitable for the working pressures for which they are recommended.

The Reducing Fittings are designed in direct proportion with the straight sizes, thus harmonizing the fittings in any combination of piping.

All fittings are recessed, which permits an easy entrance of the pipe and are accurately threaded to gauge.

INCREASED VARIETY OF SIZES

We believe the largely increased variety of sizes as tabulated on pages 130 to 148 will be found sufficient to meet the demands of the trade.

Where other than these sizes are wanted we advise the use of bushings as special fittings are always more expensive.

TESTED FITTINGS

Fittings tested to 100 pounds air pressure or 250 pounds water pressure will be furnished at special prices according to the quantity wanted.

Standard Malleable Iron Plain Pattern Screwed Fittings

Plain pattern fittings are generally used for gas systems, railings, etc.

Straight sizes up to and including 2 inches in size of Elbows, Tees, Crosses and Couplings can be furnished in Plain Pattern; also Reducers, or Reducing Couplings, up to 2 inches.

Extra Heavy Malleable Iron Screwed Fittings

Extra Heavy Malleable Iron Fittings are designed for pressures greater than 150 pounds, and are recommended for 250 pounds working pressure.

GRINNELL MALLEABLE IRON FITTINGS

Elbows—Standard Pattern

Elbow, Straight
Fig. No. 1101



Elbow, Right and Left
Fig. No. 1101-L

ELBOWS, STRAIGHT—Fig. No. 1101

Size Inches	Price, Each		Size Inches	Price, Each	
	Black	Galv.		Black	Galv.
† 1/8	.10	.13	† 2	1.05	1.70
† 1/4	.08	.12	2 1/2	2.10	3.40
† 3/8	.13	.19	3	3.10	5.10
† 1/2	.18	.26	3 1/2	4.35	7.10
† 3/4	.19	.31	4	5.20	8.45
† 1	.32	.53	4 1/2	7.20	11.75
† 1 1/4	.55	.89	5	8.50	13.85
† 1 1/2	.68	1.10	6	14.95	24.40

ELBOWS, RIGHT AND LEFT—Fig. No. 1101-L

Size Inches	Price, Each		Size Inches	Price, Each	
	Black	Galv.		Black	Galv.
1/4	.16	.....	1	.50	.75
3/8	.24	....	1 1/4	.55	.90
1/2	.18	.27	1 1/2	.69	1.10
3/4	.30	.45	2	1.05	1.70

†Straight Sizes up to 2-inch in size can be furnished in Plain Pattern at same list prices.

The Letter "L" cast on body near band of Right and Left Elbows denotes the Left Hand Thread.

For classification of Malleable Iron Fittings, see page 149.

In ordering specify Banded or Plain, Black or Galvanized.

Order by Figure Number.

GRINNELL MALLEABLE IRON FITTINGS

Reducing Elbows, 45° Elbows—Standard PatternReducing Elbow
Fig. No. 1101-R45° Elbow
Fig. No. 1102

REDUCING ELBOWS—Fig. No. 1101-R

Size Inches	Price, Each		Size Inches	Price, Each	
	Black	Galv.		Black	Galv.
$\frac{1}{4}$ x $\frac{1}{8}$	.13	.17	$1\frac{1}{2}$ x $1\frac{1}{4}$	.63	1.05
$\frac{3}{8}$ x $\frac{1}{4}$	.11	.17	$1\frac{1}{2}$ x 1	.56	.91
$\frac{3}{8}$ x $\frac{1}{8}$	.21	.28	$1\frac{1}{2}$ x $\frac{3}{4}$	.44	.72
$\frac{1}{2}$ x $\frac{3}{8}$	.18	.26	2 x $1\frac{1}{2}$	.97	1.60
$\frac{1}{2}$ x $\frac{1}{4}$	.19	.28	2 x $1\frac{1}{4}$	.88	1.45
$\frac{3}{4}$ x $\frac{1}{2}$	.26	.39	2 x 1	.71	1.15
$\frac{3}{4}$ x $\frac{3}{8}$	.22	.33	$2\frac{1}{2}$ x 2	1.40	2.25
1 x $\frac{3}{4}$	.29	.47	$2\frac{1}{2}$ x $1\frac{1}{2}$	1.35	2.25
1 x $\frac{1}{2}$	.42	.63	3 x $2\frac{1}{2}$	2.50	4.10
1 x $\frac{3}{8}$	.40	.59	3 x 2	2.15	3.55
$1\frac{1}{4}$ x 1	.50	.81	$3\frac{1}{2}$ x 3	4.15	6.80
$1\frac{1}{4}$ x $\frac{3}{4}$	.44	.71	4 x $3\frac{1}{2}$	5.65	9.25
$1\frac{1}{4}$ x $\frac{1}{2}$	.50	.81	4 x 3	5.10	8.30

45° ELBOWS—Fig. No. 1102

Size Inches	Price, Each		Size Inches	Price, Each	
	Black	Galv.		Black	Galv.
$\frac{1}{8}$	....	....	2	1.55	2.30
$\frac{1}{4}$	.08	.12	$2\frac{1}{2}$	1.65	2.65
$\frac{3}{8}$	.13	.19	3	2.40	3.95
$\frac{1}{2}$	.19	.28	$3\frac{1}{2}$	4.00	6.50
$\frac{3}{4}$	.28	.42	4	3.95	6.45
1	.50	.74	$4\frac{1}{2}$	5.05	8.25
$1\frac{1}{4}$	.75	1.10	5	6.35	10.35
$1\frac{1}{2}$	.86	1.30	6	9.60	15.85

For classification of Malleable Iron Fittings, see pages 149 and 150.
In ordering specify Banded or Plain, Black or Galvanized.
Order by Figure Number.

GRINNELL MALLEABLE IRON FITTINGS
Street Elbows—Standard Pattern



90° Street Elbow
Fig. No. 1103



45° Street Elbow
Fig. No. 1104

90° STREET ELBOWS, STRAIGHT—Fig. No. 1103

Size Inches	Price, Each		Size Inches	Price, Each	
	Black	Galv.		Black	Galv.
$\frac{1}{8}$	.10	.13	$1\frac{1}{4}$	.57	.93
$\frac{1}{4}$	.08	.12	$1\frac{1}{2}$	.69	1.10
$\frac{3}{8}$	.12	.18	2	1.20	2.00
$\frac{1}{2}$	.22	.32	$2\frac{1}{2}$	1.90	3.05
$\frac{3}{4}$	.30	.45	3	2.90	4.75
1	.35	.58	4	6.15	10.05

90° STREET ELBOWS, REDUCING—Fig. No. 1103

Size Inches	Price, Each		Size Inches	Price, Each	
	Black	Galv.		Black	Galv.
$\frac{3}{4}$ x $\frac{1}{2}$	.24	.36	2 x $1\frac{1}{2}$	1.00	1.65
1 x $\frac{3}{4}$	.47	.70	2 x $1\frac{1}{4}$	.91	1.50
1 x $\frac{1}{2}$	.42	.63	$2\frac{1}{2}$ x 2	1.85	3.00
$1\frac{1}{4}$ x 1	.44	.71	3 x $2\frac{1}{2}$	2.95	4.80
$1\frac{1}{2}$ x $1\frac{1}{4}$	.64	1.05	4 x 3	6.00	9.80

45° STREET ELBOWS—Fig. No. 1104

Size Inches	Price, Each		Size Inches	Price, Each	
	Black	Galv.		Black	Galv.
$\frac{3}{8}$	.12	.18	$1\frac{1}{2}$	.69	1.10
$\frac{1}{2}$	.22	.32	2	1.20	2.00
$\frac{3}{4}$	.30	.45	3	2.90	4.75
1	.35	.58	4	6.15	10.05
$1\frac{1}{4}$	.57	.93	.....	.....	.....

For classification of Malleable Iron Fittings, see pages 149 and 150.
In ordering specify Black or Galvanized.
Order by Figure Number.

GRINNELL MALLEABLE IRON FITTINGS

Service Tees—Standard Pattern

Service Tee
Fig. No. 1106

SERVICE TEES, STRAIGHT—Fig. No. 1106

Size Inches	Price, Each		Size Inches	Price, Each	
	Black	Galv.		Black	Galv.
$\frac{3}{8}$	.20	.30	$1\frac{1}{2}$	.95	1.55
$\frac{1}{2}$	.26	.38	2	1.55	2.55
$\frac{3}{4}$	.39	.59	$2\frac{1}{2}$	2.50	4.10
1	.39	.64	3	3.55	5.80
$1\frac{1}{4}$	.75	1.25	....	....	....

SERVICE TEES, REDUCING—Fig. No. 1106

Size Inches	Price, Each		Size Inches	Price, Each	
	Black	Galv.		Black	Galv.
$\frac{3}{4} \times \frac{1}{2} \times \frac{3}{4}$	.36	.54	$1\frac{1}{2} \times 1\frac{1}{4} \times 1\frac{1}{2}$	.89	1.45
1 x 1 x $\frac{3}{4}$	.67	1.00	$1\frac{1}{2} \times 1 \times 1\frac{1}{2}$	.86	1.40
1 x $\frac{3}{4} \times 1$	.48	.72	$1\frac{1}{2} \times \frac{3}{4} \times 1\frac{1}{2}$	.82	1.35
$\frac{3}{4} \times \frac{3}{4} \times 1$	.42	.62	2 x $1\frac{1}{2} \times 2$	1.45	2.40
$1\frac{1}{4} \times 1 \times 1\frac{1}{4}$	.68	1.10	$2\frac{1}{2} \times 2 \times 2\frac{1}{2}$	2.20	3.60
$1\frac{1}{4} \times 1 \times 1$	.60	.98	3 x $2\frac{1}{2} \times 3$	2.95	4.90
$1\frac{1}{4} \times \frac{3}{4} \times 1\frac{1}{4}$	.49	.81	3 x 3 x 4	3.90	6.40
1 x 1 x $1\frac{1}{4}$	.42	.68	.....	....	....

For classification of Malleable Iron Fittings, see pages 149 and 150.
In ordering specify Black or Galvanized.
Order by Figure Number.

GRINNELL MALLEABLE IRON FITTINGS

Side Outlet Elbows and Tees—Standard PatternSide Outlet Elbow
Fig. No. 1109Side Outlet Tee
Fig. No. 1113

SIDE OUTLET ELBOWS, STRAIGHT—Fig. No. 1109

Size Inches	Price, Each		Size Inches	Price, Each	
	Black	Galv.		Black	Galv.
$\frac{3}{8}$	.13	.19	$1\frac{1}{4}$	1.10	1.60
$\frac{1}{2}$	.24	.36	$1\frac{1}{2}$	1.10	1.65
$\frac{3}{4}$	.38	.56	2	1.65	2.45
1	.51	.76	.....	....	....

SIDE OUTLET ELBOWS, REDUCING—Fig. No. 1109

Size Inches	Price, Each		Size Inches	Price, Each	
	Black	Galv.		Black	Galv.
$\frac{3}{8} \times \frac{3}{8} \times \frac{1}{4}$	.14	.20	$\frac{3}{4} \times \frac{3}{4} \times \frac{3}{8}$	.34	.50
$\frac{1}{2} \times \frac{1}{2} \times \frac{3}{8}$	.22	.33	1 x 1 x $\frac{3}{4}$	.40	.59
$\frac{3}{4} \times \frac{3}{4} \times \frac{1}{2}$	.36	.53	$1\frac{1}{4} \times 1\frac{1}{4} \times 1$	1.05	1.60

SIDE OUTLET TEES—Fig. No. 1113

Size Inches	Price, Each		Size Inches	Price, Each	
	Black	Galv.		Black	Galv.
$\frac{3}{8}$	.18	.28	$1\frac{1}{4}$	1.00	1.50
$\frac{1}{2}$	.23	.35	$1\frac{1}{2}$	1.20	1.80
$\frac{3}{4}$	.34	.52	2	1.90	2.85
1	.61	.92	.....	....	....

Furnished plain only.

For classification of Malleable Iron Fittings, see page 149.

In ordering specify Black or Galvanized.

Order by Figure Number.

GRINNELL MALLEABLE IRON FITTINGS

Tees—Standard Pattern



Tee

Fig. No. 1105

TEES, STRAIGHT—Fig. No. 1105

Size Inches	Price, Each		Size Inches	Price, Each	
	Black	Galv.		Black	Galv.
† 1/8	.13	.17	† 2	1.45	2.40
† 1/4	.11	.17	2 1/2	2.60	4.40
† 3/8	.18	.26	3	4.15	6.85
† 1/2	.24	.36	3 1/2	5.50	9.05
† 3/4	.27	.44	4	6.85	11.30
† 1	.43	.70	4 1/2	9.70	16.00
† 1 1/4	.74	1.20	5	12.20	20.10
† 1 1/2	.96	1.60	6	17.35	28.55

TEES, REDUCING—Fig. No. 1105

1/4 X 1/4 X 1/8	.19	.26	3/4 X 1/2 X 3/4	.37	.55
1/8 X 1/8 X 1/4	.14	.19	3/4 X 1/2 X 1/2	.36	.54
3/8 X 3/8 X 1/4	.17	.25	3/4 X 1/2 X 3/8	.29	.43
3/8 X 3/8 X 1/8	.37	.49	3/4 X 1/2 X 1/4	.39	.59
3/8 X 1/4 X 3/8	.16	.24	3/4 X 3/8 X 3/4	.41	.61
3/8 X 1/4 X 1/4	.09	.13	3/4 X 3/8 X 1/2	.37	.55
1/4 X 1/4 X 3/8	.22	.34	3/4 X 3/8 X 3/8	.34	.52
1/2 X 1/2 X 3/8	.26	.38	3/4 X 1/4 X 3/4	.46	.69
1/2 X 1/2 X 1/4	.22	.34	1/2 X 1/2 X 3/4	.34	.50
1/2 X 3/8 X 1/2	.26	.40	1/2 X 3/8 X 3/4	.28	.42
1/2 X 3/8 X 3/8	.19	.29	3/8 X 3/8 X 3/4	.30	.46
1/2 X 3/8 X 1/4	.18	.26	1 X 1 X 3/4	.43	.70
1/2 X 1/4 X 1/2	.16	.24	1 X 1 X 1/2	.62	.93
3/8 X 3/8 X 1/2	.20	.30	1 X 1 X 3/8	.66	.99
3/4 X 3/4 X 1/2	.35	.53	1 X 1 X 1/4	1.35	2.05
3/4 X 3/4 X 3/8	.32	.48	1 X 3/4 X 1	.45	.74
3/4 X 3/4 X 1/4	.32	.48	1 X 3/4 X 3/4	.39	.64

†Straight Sizes up to 2-inch can be furnished in Plain Pattern at same list prices.

For classification of Malleable Iron Fittings, see page 149.

In ordering specify Banded or Plain, Black or Galvanized.

Order by Figure Number.

GRINNELL MALLEABLE IRON FITTINGS

Tees—Standard Pattern
(Continued)



Tee
Fig. No. 1105

TEES, REDUCING—Fig. No. 1105

Size Inches	Price, Each		Size Inches	Price, Each	
	Black	Galv.		Black	Galv.
1 x $\frac{3}{4}$ x $\frac{1}{2}$	.44	.66	$1\frac{1}{4}$ x $\frac{1}{2}$ x $1\frac{1}{4}$	.88	1.30
1 x $\frac{3}{4}$ x $\frac{3}{8}$	.46	.69	$1\frac{1}{4}$ x $\frac{1}{2}$ x 1	.88	1.30
1 x $\frac{1}{2}$ x 1	.58	.87	$1\frac{1}{4}$ x $\frac{3}{8}$ x $1\frac{1}{4}$	.91	1.35
1 x $\frac{1}{2}$ x $\frac{3}{4}$	.60	.90	1 x 1 x $1\frac{1}{4}$	.58	.95
1 x $\frac{1}{2}$ x $\frac{1}{2}$	.48	.72	1 x $\frac{3}{4}$ x $1\frac{1}{4}$	.51	.85
1 x $\frac{1}{2}$ x $\frac{3}{8}$	.55	.83	$\frac{3}{4}$ x $\frac{3}{4}$ x $1\frac{1}{4}$	.50	.81
1 x $\frac{3}{8}$ x 1	.72	1.10	$1\frac{1}{2}$ x $1\frac{1}{2}$ x $1\frac{1}{4}$	.83	1.35
1 x $\frac{3}{8}$ x $\frac{3}{4}$	.61	.91	$1\frac{1}{2}$ x $1\frac{1}{2}$ x 1	.78	1.30
1 x $\frac{3}{8}$ x $\frac{1}{2}$	.54	.81	$1\frac{1}{2}$ x $1\frac{1}{2}$ x $\frac{3}{4}$	.75	1.25
$\frac{3}{4}$ x $\frac{3}{4}$ x 1	.36	.60	$1\frac{1}{2}$ x $1\frac{1}{2}$ x $\frac{1}{2}$	.95	1.45
$\frac{3}{4}$ x $\frac{1}{2}$ x 1	.52	.78	$1\frac{1}{2}$ x $1\frac{1}{2}$ x $\frac{3}{8}$	.86	1.30
$\frac{3}{4}$ x $\frac{3}{8}$ x 1	.54	.81	$1\frac{1}{2}$ x $1\frac{1}{4}$ x $1\frac{1}{2}$	.87	1.45
$\frac{1}{2}$ x $\frac{1}{2}$ x 1	.46	.69	$1\frac{1}{2}$ x $1\frac{1}{4}$ x $1\frac{1}{4}$	.78	1.30
$1\frac{1}{4}$ x $1\frac{1}{4}$ x 1	.62	1.05	$1\frac{1}{2}$ x $1\frac{1}{4}$ x 1	.69	1.15
$1\frac{1}{4}$ x $1\frac{1}{4}$ x $\frac{3}{4}$	.58	.95	$1\frac{1}{2}$ x $1\frac{1}{4}$ x $\frac{3}{4}$	.68	1.10
$1\frac{1}{4}$ x $1\frac{1}{4}$ x $\frac{1}{2}$	.80	1.20	$1\frac{1}{2}$ x $1\frac{1}{4}$ x $\frac{1}{2}$	.83	1.35
$1\frac{1}{4}$ x $1\frac{1}{4}$ x $\frac{3}{8}$	.74	1.10	$1\frac{1}{2}$ x 1 x $1\frac{1}{2}$	.83	1.35
$1\frac{1}{4}$ x 1 x $1\frac{1}{4}$	.66	1.10	$1\frac{1}{2}$ x 1 x $1\frac{1}{4}$	.76	1.25
$1\frac{1}{4}$ x 1 x 1	.64	1.05	$1\frac{1}{2}$ x 1 x 1	.71	1.15
$1\frac{1}{4}$ x 1 x $\frac{3}{4}$	.43	.71	$1\frac{1}{2}$ x $\frac{3}{4}$ x $1\frac{1}{2}$	.78	1.30
$1\frac{1}{4}$ x 1 x $\frac{1}{2}$	.76	1.15	$1\frac{1}{2}$ x $\frac{3}{4}$ x $\frac{3}{4}$	.73	1.20
$1\frac{1}{4}$ x 1 x $\frac{3}{8}$	.70	1.05	$1\frac{1}{2}$ x $\frac{1}{2}$ x $1\frac{1}{2}$	1.20	1.75
$1\frac{1}{4}$ x $\frac{3}{4}$ x $1\frac{1}{4}$	.63	1.05	$1\frac{1}{2}$ x $\frac{3}{8}$ x $1\frac{1}{2}$	1.30	1.90
$1\frac{1}{4}$ x $\frac{3}{4}$ x 1	.52	.86	$1\frac{1}{4}$ x $1\frac{1}{4}$ x $1\frac{1}{2}$	.79	1.30
$1\frac{1}{4}$ x $\frac{3}{4}$ x $\frac{3}{4}$	.52	.95	$1\frac{1}{4}$ x 1 x $1\frac{1}{2}$	.87	1.45

For classification of Malleable Iron Fittings, see page 149.
In ordering specify Black or Galvanized.
Order by Figure Number.

GRINNELL MALLEABLE IRON FITTINGS

Tees—Standard Pattern
(Continued)

TEES, REDUCING—Fig. No. 1105

Size Inches	Price, Each		Size Inches	Price, Each	
	Black	Galv.		Black	Galv.
1 x1 x1 $\frac{1}{2}$	.71	1.15	2 x2 x2 $\frac{1}{2}$	1.90	3.15
2 x2 x1 $\frac{1}{2}$	1.25	2.05	3 x3 x2 $\frac{1}{2}$	3.25	5.35
2 x2 x1 $\frac{1}{4}$	1.10	1.85	3 x3 x2	3.05	5.05
2 x2 x1	1.05	1.75	3 x3 x1 $\frac{1}{2}$	2.55	4.15
2 x2 x $\frac{3}{4}$	.89	1.45	3 x3 x1 $\frac{1}{4}$	3.00	4.90
2 x2 x $\frac{1}{2}$	1.25	1.85	3 x3 x1	3.05	5.00
2 x2 x $\frac{3}{8}$	1.30	2.15	3 x3 x $\frac{3}{4}$	2.60	4.30
2 x1 $\frac{1}{2}$ x2	1.30	2.15	3 x2 $\frac{1}{2}$ x3	3.40	5.55
2 x1 $\frac{1}{2}$ x1 $\frac{1}{2}$	1.15	1.85	3 x2 $\frac{1}{2}$ x2	3.40	5.55
2 x1 $\frac{1}{2}$ x1 $\frac{1}{4}$	1.10	1.75	3 x2 x3	3.40	5.55
2 x1 $\frac{1}{2}$ x1	.91	1.50	2 $\frac{1}{2}$ x2 $\frac{1}{2}$ x3	3.25	5.35
2 x1 $\frac{1}{4}$ x2	1.25	2.10	2 x2 x3	2.40	4.00
2 x1 $\frac{1}{4}$ x1 $\frac{1}{2}$	1.15	1.85	3 $\frac{1}{2}$ x3 $\frac{1}{2}$ x3	5.05	8.35
2 x1 $\frac{1}{4}$ x1 $\frac{1}{4}$	1.20	2.00	3 $\frac{1}{2}$ x3 $\frac{1}{2}$ x2 $\frac{1}{2}$	4.15	6.85
2 x1 x2	1.30	2.15	4 x4 x3 $\frac{1}{2}$	7.55	12.40
2 x $\frac{3}{4}$ x2	1.05	1.70	4 x4 x3	6.25	10.25
2 x $\frac{1}{2}$ x2	1.80	2.70	4 x4 x2 $\frac{1}{2}$	5.40	8.90
2 x $\frac{3}{8}$ x2	1.80	2.70	4 x4 x2	4.50	7.40
1 $\frac{1}{2}$ x1 $\frac{1}{2}$ x2	1.15	1.95	4 x4 x1 $\frac{1}{2}$	4.50	7.40
1 $\frac{1}{2}$ x1 $\frac{1}{4}$ x2	1.15	1.95	4 x4 x1 $\frac{1}{4}$	4.70	7.70
1 $\frac{1}{4}$ x1 $\frac{1}{4}$ x2	.92	1.50	4 x4 x1	4.45	7.30
1 x1 x2	.94	1.55	4 x3 x4	6.10	10.05
2 $\frac{1}{2}$ x2 $\frac{1}{2}$ x2	2.35	3.85	4 x3 x3	6.10	10.05
2 $\frac{1}{2}$ x2 $\frac{1}{2}$ x1 $\frac{1}{2}$	1.35	2.25	5 x5 x4	13.00	21.40
2 $\frac{1}{2}$ x2 $\frac{1}{2}$ x1 $\frac{1}{4}$	1.80	3.00	5 x5 x3	10.90	18.00
2 $\frac{1}{2}$ x2 $\frac{1}{2}$ x1	1.35	2.25	5 x5 x2	6.50	10.70
2 $\frac{1}{2}$ x2 $\frac{1}{2}$ x $\frac{3}{4}$	1.65	2.75	6 x6 x4	13.25	21.85
2 $\frac{1}{2}$ x2 x2 $\frac{1}{2}$	2.35	3.90	6 x6 x3	11.15	18.35
2 $\frac{1}{2}$ x2 x2	2.30	3.75	6 x6 x2 $\frac{1}{2}$	10.70	18.00
2 $\frac{1}{2}$ x2 x1 $\frac{1}{2}$	2.25	3.65	6 x6 x2	10.60	17.45
2 $\frac{1}{2}$ x1 $\frac{1}{2}$ x2 $\frac{1}{2}$	2.35	3.90	.....	.....	.....

For classification of Malleable Iron Fittings, see page 149.
In ordering specify Black or Galvanized.
Order by Figure Number.

GRINNELL MALLEABLE IRON FITTINGS

Crosses—Standard Pattern



Cross
Fig. No. 1107

CROSSES, STRAIGHT—Fig. No. 1107

Size Inches	Price, Each		Size Inches	Price, Each	
	Black	Galv.		Black	Galv.
† 1/4	.10	.16	† 2	1.80	3.00
† 3/8	.22	.34	2 1/2	3.10	5.20
† 1/2	.32	.48	3	4.75	7.85
† 3/4	.47	.73	3 1/2	5.50	9.15
† 1	1.00	1.50	4	8.75	14.55
† 1 1/4	.79	1.30	5	14.95	24.85
† 1 1/2	1.15	1.90	6	20.40	33.90

CROSSES, REDUCING—Fig. No. 1107

3/8X 3/8X 1/4X 1/4	.19	.29	1 1/4X 1 1/4X 3/8X 3/8	.86	1.30
1/2X 1/2X 3/8X 3/8	.24	.36	1 1/4X 1 x 1 x 1	.49	.82
1/2X 1/2X 1/4X 1/4	.24	.36	1 1/4X 1 x 3/4X 3/4	.48	.79
1/2X 3/8X 3/8X 3/8	.23	.35	1 1/2X 1 1/2X 1 1/4X 1 1/4	.96	1.60
3/4X 3/4X 1/2X 1/2	.42	.64	1 1/2X 1 1/2X 1 x 1	.84	1.40
3/4X 3/4X 3/8X 3/8	.38	.57	1 1/2X 1 1/2X 3/4X 3/4	.65	1.10
3/4X 1/2X 1/2X 1/2	.48	.73	1 1/2X 1 1/2X 1/2X 1/2	1.05	1.60
3/4X 1/2X 3/8X 3/8	.46	.70	1 1/2X 1 1/4X 1 1/4X 1 1/4	1.05	1.75
3/4X 3/8X 1/2X 1/2	.46	.69	2 x 2 x 1 1/2X 1 1/2	2.00	3.35
1 x 1 x 3/4X 3/4	.78	1.15	2 x 2 x 1 1/4X 1 1/4	1.60	2.65
1 x 1 x 1/2X 1/2	.64	.97	2 x 2 x 1 x 1	1.15	2.30
1 x 1 x 3/8X 3/8	.58	.88	2 x 2 x 3/4X 3/4	.91	1.50
1 x 3/4X 3/4X 3/4	.72	1.10	2 x 2 x 1/2X 1/2	1.50	2.30
1 x 3/4X 1/2X 1/2	.70	1.05	2 1/2X 2 1/2X 2 x 2	2.60	4.30
1 x 3/4X 3/8X 3/8	.50	.75	3 x 3 x 2 1/2X 2 1/2	3.90	6.45
1 x 1/2X 3/8X 3/8	.52	.79	3 x 3 x 2 x 2	3.40	5.60
1 1/4X 1 1/4X 1 x 1	.77	1.30	4 x 4 x 3 x 3	5.70	10.30
1 1/4X 1 1/4X 3/4X 3/4	.83	1.40	4 x 4 x 2 x 2	5.55	9.20
1 1/4X 1 1/4X 1/2X 1/2	.84	1.25			

†Straight Sizes up to 2-inch can be furnished in Plain Pattern at same list prices.

For classification of Malleable Iron Fittings, see pages 149 and 150.
In ordering specify Banded or Plain, Black or Galvanized.
Order by Figure Number.

GRINNELL MALLEABLE IRON FITTINGS

Y Branches, Caps, Crossovers—Standard Pattern



45° Y Branch or Lateral
Fig. No. 1108



Cap
Fig. No. 1124



Cross Over
Fig. No. 1129

45° Y BRANCHES OR LATERALS, STRAIGHT—Fig. No. 1108

Size Inches	Price, Each		Size Inches	Price, Each	
	Black	Galv.		Black	Galv.
$\frac{1}{2}$	.37	.55	$1\frac{1}{4}$	1.45	2.15
$\frac{3}{4}$	.40	.59	$1\frac{1}{2}$	1.90	2.85
1	.80	1.20	2	3.20	4.75

45° Y BRANCHES OR LATERALS, REDUCING—Fig. No. 1108

$1\frac{1}{4} \times 1\frac{1}{4} \times \frac{3}{4}$	1.10	1.60	$2 \times 1\frac{1}{2} \times 2$	2.25	3.30
$1\frac{1}{2} \times 1\frac{1}{2} \times 1\frac{1}{4}$	1.90	2.80	$2 \times 1\frac{1}{2} \times 1\frac{1}{2}$	1.80	2.65
$1\frac{1}{2} \times 1\frac{1}{4} \times 1\frac{1}{2}$	1.90	2.85	$2 \times 1\frac{1}{2} \times 1\frac{1}{4}$	1.70	2.55
$1\frac{1}{2} \times 1\frac{1}{4} \times 1\frac{1}{4}$	1.90	2.80	$2 \times 1\frac{1}{4} \times 2$	2.15	3.20
$2 \times 2 \times 1\frac{1}{2}$	3.30	4.90	$2 \times 1\frac{1}{4} \times 1\frac{1}{2}$	2.00	3.00
$2 \times 2 \times 1\frac{1}{4}$	2.60	3.85	$2 \times 1\frac{1}{4} \times 1\frac{1}{4}$	2.20	3.25

CAPS—Fig. No. 1124

$\frac{1}{8}$	.06	.08	2	.59	.97
$\frac{1}{4}$	.04	.06	$2\frac{1}{2}$	.99	1.60
$\frac{3}{8}$	.06	.08	3	1.55	2.50
$\frac{1}{2}$	.13	.19	$3\frac{1}{2}$	2.05	3.35
$\frac{3}{4}$	.16	.24	4	2.45	4.00
1	.30	.45	5	3.95	6.45
$1\frac{1}{4}$	.30	.48	6	6.65	10.80
$1\frac{1}{2}$	.36	.59	.....	.....	.....

CROSS OVERS—Fig. No. 1129

$\frac{1}{2}$	.20	.25	1	.45	.60
$\frac{3}{4}$	.30	.40	.....	.....	.....

For classification of Malleable Iron Fittings, see page 149.
In ordering specify Black or Galvanized.
Order by Figure Number.

GRINNELL MALLEABLE IRON FITTINGS

Couplings, R.H.—R. and L.—Standard PatternCoupling R. H.
Fig. No. 1121Coupling R. and L.
Fig. No. 1122

COUPLINGS, R.H.—Fig. No. 1121

Size Inches	Price, Each		Size Inches	Price, Each	
	Black	Galv.		Black	Galv.
$\frac{1}{8}$	..	..	†2	.83	1.35
† $\frac{1}{4}$	.06	.09	2½	1.35	2.20
† $\frac{3}{8}$	.10	.14	3	2.10	3.40
† $\frac{1}{2}$	.18	.27	3½	4.20	6.25
† $\frac{3}{4}$	.26	.38	4	4.95	7.30
†1	.30	.49	4½	6.70	9.90
†1¼	.44	.71	5	7.60	11.30
†1½	.52	.85	6	11.50	17.05

COUPLINGS, R. AND L.—Fig. No. 1122

Size Inches	Price, Each		Size Inches	Price, Each	
	Black	Galv.		Black	Galv.
$\frac{1}{4}$	.07	.11	1¼	.44	.72
$\frac{3}{8}$	.12	.18	1½	.52	.85
$\frac{1}{2}$	.16	.24	2	.83	1.35
$\frac{3}{4}$	.29	.43	2½	1.30	2.10
1	.33	.53	3	1.75	2.90

†R.H. Couplings up to 2-inch can be furnished in Plain Pattern at same list prices.

For classification of Malleable Iron Fittings, see pages 149 and 151.
In ordering specify Banded or Plain, Black or Galvanized.
Order by Figure Number.

GRINNELL MALLEABLE IRON FITTINGS

Reducers—Standard Pattern

Reducer
Fig. No. 1125

REDUCERS—Fig. No. 1125

Size Inches	Price, Each		Size Inches	Price, Each	
	Black	Galv.		Black	Galv.
† 1/4 x 1/8	.13	.17	2 x 1	.66	1.10
3/8 x 1/4	.10	.14	2 x 3/4	.68	1.10
3/8 x 1/8	.14	.19	2 x 1/2	.94	1.45
† 1/2 x 3/8	.15	.23	2 1/2 x 2	1.15	1.90
† 1/2 x 1/4	.13	.19	2 1/2 x 1 1/2	.95	1.55
1/2 x 1/8	.29	.38	2 1/2 x 1 1/4	1.00	1.65
† 3/4 x 1/2	.22	.33	2 1/2 x 1	1.10	1.80
3/4 x 3/8	.18	.27	3 x 2 1/2	1.60	2.65
3/4 x 1/4	.21	.31	3 x 2	1.55	2.55
† 1 x 3/4	.40	.59	3 x 1 1/2	1.45	2.40
1 x 1/2	.35	.52	3 x 1 1/4	1.45	2.35
1 x 3/8	.33	.49	3 x 1	1.45	2.35
1 x 1/4	.32	.47	3 1/2 x 3	2.35	3.80
† 1 1/4 x 1	.33	.53	3 1/2 x 2 1/2	2.10	3.40
1 1/4 x 3/4	.26	.42	3 1/2 x 2	1.65	2.70
1 1/4 x 1/2	.36	.53	4 x 3 1/2	3.25	5.30
1 1/4 x 3/8	.40	.59	4 x 3	2.90	4.75
† 1 1/2 x 1 1/4	.50	.81	4 x 2 1/2	2.50	4.10
1 1/2 x 1	.42	.68	4 x 2	2.45	3.95
1 1/2 x 3/4	.39	.64	4 x 1 1/2	2.40	3.95
1 1/2 x 1/2	.56	.83	4 x 1 1/4	2.50	4.10
† 2 x 1 1/2	.68	1.10	4 x 1	2.50	4.05
† 2 x 1 1/4	.68	1.10	.....	....	....

†Indicates Reducers which can be furnished in Plain Pattern at same list prices.

For classification of Malleable Iron Fittings, see pages 149 and 151.

In ordering specify Banded or Plain, Black or Galvanized.

Order by Figure Number.

GRINNELL MALLEABLE IRON FITTINGS

Bushings—Standard Pattern

Hex Bushing
Fig. No. 1127



Face Bushing
Fig. No. 1128

HEX BUSHINGS—Fig. No. 1127

Size Inches	Price, Each		Size Inches	Price, Each	
	Black	Galv.		Black	Galv.
$\frac{1}{4} \times \frac{1}{8}$	.04	.08	$1\frac{1}{4} \times 1\frac{1}{4}$	.07	.14
$\frac{3}{8} \times \frac{1}{4}$	.04	.08	$1\frac{1}{2} \times 1$	.09	.18
$\frac{1}{2} \times \frac{3}{8}$	.04	.08	$2 \times 1\frac{1}{2}$	.14	.28
$\frac{3}{4} \times \frac{1}{2}$	.05	.10	$2\frac{1}{2} \times 2$	.21	.42
$1 \times \frac{3}{4}$	.06	.12	.....	.....	.....

FACE BUSHINGS—Fig. No. 1128

Size Inches	Price, Each		Size Inches	Price, Each	
	Black	Galv.		Black	Galv.
$\frac{3}{8} \times \frac{1}{4}$	.08	.12	$1\frac{1}{4} \times \frac{1}{2}$	.17	.25
$\frac{3}{8} \times \frac{1}{8}$	.08	.12	$1\frac{1}{4} \times \frac{3}{8}$	.17	.25
$\frac{1}{2} \times \frac{3}{8}$	.09	.14	$1\frac{1}{4} \times \frac{1}{4}$	.17	.25
$\frac{1}{2} \times \frac{1}{4}$	.09	.14	$1\frac{1}{2} \times 1\frac{1}{4}$	.22	.33
$\frac{3}{4} \times \frac{1}{2}$	.11	.17	$1\frac{1}{2} \times 1$	.22	.33
$\frac{3}{4} \times \frac{3}{8}$	.11	.17	$1\frac{1}{2} \times \frac{3}{4}$	.22	.33
$\frac{3}{4} \times \frac{1}{4}$	.11	.17	$1\frac{1}{2} \times \frac{1}{2}$	.22	.33
$1 \times \frac{3}{4}$	.13	.20	$1\frac{1}{2} \times \frac{3}{8}$	.22	.33
$1 \times \frac{1}{2}$	.13	.20	$1\frac{1}{2} \times \frac{1}{4}$	.22	.33
$1 \times \frac{3}{8}$	.13	.20	$2 \times 1\frac{1}{2}$	.32	.48
$1 \times \frac{1}{4}$	.13	.20	$2 \times 1\frac{1}{4}$	.32	.48
$1\frac{1}{4} \times 1$	.17	.25	2×1	.32	.48
$1\frac{1}{4} \times \frac{3}{4}$	.17	.25	$2 \times \frac{3}{4}$	.32	.48

For Cast Iron Bushings, see page 53.
In ordering specify Black or Galvanized.
Order by Figure Number.

GRINNELL MALLEABLE IRON FITTINGS

*Bushings—Standard Pattern**(Continued)*FACE BUSHINGS—Fig. No. 1128—*(Continued)*

Size Inches	Price, Each		Size Inches	Price, Each	
	Black	Galv.		Black	Galv.
2 x 1/2	.32	.48	5 x 4	2.60	3.90
2 x 3/8	.32	.48	5 x 3 1/2	2.60	3.90
2 x 1/4	.32	.48	5 x 3	2.60	3.90
2 1/2 x 2	.48	.72	5 x 2 1/2	2.60	3.90
2 1/2 x 1 1/2	.48	.72	5 x 2	2.60	3.90
2 1/2 x 1 1/4	.48	.72	6 x 5	3.75	5.60
2 1/2 x 1	.48	.72	6 x 4 1/2	3.75	5.60
2 1/2 x 3/4	.48	.72	6 x 4	3.75	5.60
3 x 2 1/2	.70	1.05	6 x 3 1/2	3.75	5.60
3 x 2	.70	1.05	6 x 3	3.75	5.60
3 x 1 1/2	.70	1.05	6 x 2 1/2	3.75	5.60
3 x 1 1/4	.70	1.05	6 x 2	3.75	5.60
3 x 1	.70	1.05	7 x 6	8.00	12.00
3 x 3/4	.70	1.05	7 x 5	8.00	12.00
3 1/2 x 3	1.20	1.80	7 x 4 1/2	8.00	12.00
3 1/2 x 2 1/2	1.20	1.80	7 x 4	8.00	12.00
3 1/2 x 2	1.20	1.80	7 x 3	8.00	12.00
3 1/2 x 1 1/2	1.20	1.80	7 x 2 1/2	8.00	12.00
3 1/2 x 1 1/4	1.20	1.80	7 x 2	8.00	12.00
3 1/2 x 1	1.20	1.80	8 x 7	9.00	13.50
4 x 3 1/2	1.50	2.25	8 x 6	9.00	13.50
4 x 3	1.50	2.25	8 x 5	9.00	13.50
4 x 2 1/2	1.50	2.25	8 x 4	9.00	13.50
4 x 2	1.50	2.25	8 x 3	9.00	13.50
4 x 1 1/2	1.50	2.25	8 x 2 1/2	9.00	13.50
4 x 1 1/4	1.50	2.25	10 x 8	14.00	.....
4 x 1	1.50	2.25	10 x 7	14.00	.....
4 1/2 x 4	2.10	3.15	10 x 6	14.00	.....
4 1/2 x 3 1/2	2.10	3.15	10 x 5	14.00	.....
4 1/2 x 3	2.10	3.15	10 x 4	14.00	.....
4 1/2 x 2 1/2	2.10	3.15	12 x 10	20.00	.....
4 1/2 x 2	2.10	3.15	12 x 8	20.00	.....
5 x 4 1/2	2.60	3.90	12 x 6	20.00	.....

For Cast Iron Bushings, see page 53.
 In ordering specify Black or Galvanized.
 Order by Figure Number.

GRINNELL MALLEABLE IRON FITTINGS

Return Bends—Standard PatternClose Pattern
Fig. No. 1117Medium Pattern
Fig. No. 1118Open Pattern
Fig. No. 1119

CLOSE PATTERN—Fig. No. 1117

Size.....Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Right Hand, Black.....Each	.29	.38	.72	.75	1.00	1.55
Right Hand, Galv.....Each	.43	.57	1.05	1.20	1.65	2.55
R. and L., Black.....Each	.58	.39	.73	1.20	1.55	2.50
R. and L., Galv.....Each	.76	.58	1.10	1.75	2.30	3.70
Centre to Centre.....Inches	1	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	$2\frac{3}{16}$	$2\frac{5}{8}$

MEDIUM PATTERN—Fig. No. 1118

Size.....Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Right Hand, Black.....Each	.29	.42	.93	.85	1.05	1.85
Right Hand, Galv.....Each	.43	.62	1.40	1.40	1.70	3.05
R. and L., Black.....Each	.64	.43	.94	1.35	1.65	2.90
R. and L., Galv.....Each	.85	.64	1.40	2.00	2.40	4.25
Centre to Centre.....Inches	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{7}{8}$	$2\frac{1}{4}$	$2\frac{1}{2}$	3

OPEN PATTERN—Fig. No. 1119

Size.....Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Right Hand, Black.....Each	.32	.50	.96	.94	1.25	2.00
Right Hand, Galv.....Each	.47	.75	1.40	1.55	2.10	3.20
R. and L., Black.....Each	.66	.51	1.00	1.45	2.00	3.05
R. and L., Galv.....Each	.87	.76	1.50	2.15	3.00	4.55
Centre to Centre.....Inches	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4

For classification of Malleable Iron Fittings, see page 149.
 In ordering specify Black or Galvanized.
 Order by Figure Number.

GRINNELL MALLEABLE IRON FITTINGS

Drop Elbows and Tees—Standard Pattern

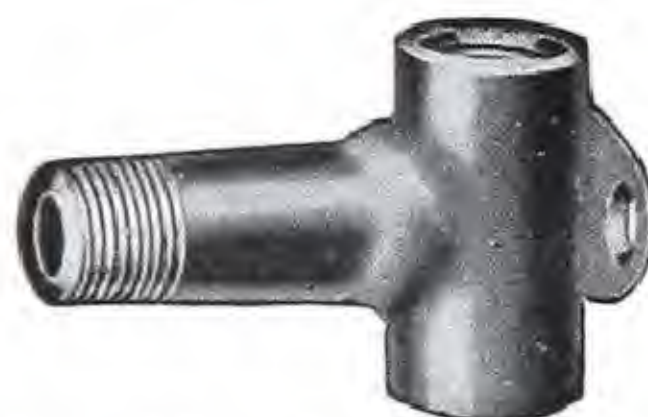
Female Drop Elbow
Fig. No. 1110



Male and Female Drop Elbow, Long
Fig. No. 1112



Female Drop Tee
Fig. No. 1114



Male and Female Drop Tee, Long
Fig. No. 1116

FEMALE DROP ELBOWS—Fig. No. 1110

Size.....Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{3}{8} \times \frac{1}{4}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{3}{4} \times \frac{1}{2}$
Price, Black.....Each	.10	.18	.13	.27	.46	.41
Price, Galv.....Each	.14	.26	.19	.40	.68	.61

MALE AND FEMALE DROP ELBOW, LONG—Fig. No. 1112

Size.....Inches	$\frac{3}{8}$	$\frac{1}{4} \times \frac{3}{8}$	$\frac{1}{2}$	$\frac{1}{2} \times \frac{3}{8}$
Price, Black.....Each	.22	.18	.38	.34
Price, Galv.....Each	.32	.27	.57	.50

FEMALE DROP TEES—Fig. No. 1114

Size.....Inches	$\frac{3}{8}$	$\frac{3}{8} \times \frac{3}{8} \times \frac{1}{4}$	$\frac{1}{2}$	$\frac{1}{2} \times \frac{1}{2} \times \frac{3}{8}$	$\frac{1}{2} \times \frac{3}{8} \times \frac{3}{8}$	$\frac{3}{4}$
Price, Black.....Each	.19	.17	.29	.22	.21	.39
Price, Galv.....Each	.28	.25	.43	.32	.31	.58

Size.....Inches	$\frac{3}{4} \times \frac{3}{4} \times \frac{1}{2}$	$\frac{3}{4} \times \frac{3}{4} \times \frac{3}{8}$	$\frac{3}{4} \times \frac{3}{4} \times \frac{1}{4}$	$\frac{3}{4} \times \frac{1}{2} \times \frac{3}{8}$	$1 \times 1 \times \frac{3}{8}$
Price, Black.....Each	.35	.31	.33	.35	.58
Price, Galv.....Each	.52	.46	.49	.52	.85

MALE AND FEMALE DROP TEES, LONG—Fig. No. 1116

Size.....Inches	$\frac{3}{8}$	$\frac{3}{4} \times \frac{3}{4} \times \frac{1}{2}$	$1 \times 1 \times \frac{1}{2}$	$1 \frac{1}{4} \times 1 \frac{1}{4} \times \frac{1}{2}$
Price, Black.....Each	.18	.46	.49	.74
Price, Galv.....Each	.27	.69	.72	1.10

Furnished plain only.

For classification of Malleable Iron Fittings, see page 149.

In ordering specify Black or Galvanized.

Order by Figure Number.

GRINNELL MALLEABLE IRON FITTINGS

Standard Pattern

Waste Nut
Fig. No. 1133Lock Nut
Fig. No. 1134R. and L. Hex Nipple
Fig. No. 1135Pump Rod Coupling
Fig. No. 1136

WASTE NUTS—Fig. No. 1133

Size.....Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$
Price, Black.....Each	.03	.05	.08	.10	.14	.22	.35
Price, Galv.....Each	.05	.07	.12	.14	.20	.32	.52

LOCKNUTS—Fig. No. 1134

Size.....Inches	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$
Price, Black.....Each	.04	.03	.04	.06	.10
Price, Galv.....Each	.06	.05	.06	.09	.14

Size.....Inches	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Price, Black.....Each	.15	.23	.17	.22
Price, Galv.....Each	.23	.34	.27	.36

RIGHT AND LEFT HEX NIPPLES—Fig. No. 1135

Size.....Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$
Price, Black.....Each	.20	.20	.20	.25	.30	.40

Size.....Inches	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4
Price, Black.....Each	.50	.70	1.10	1.50	1.90	2.40

PUMP ROD COUPLINGS—Fig. No. 1136

Size.....Inches	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{1}{2} \times \frac{3}{8}$	$\frac{1}{2}$	$\frac{1}{2} \times \frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$
Price, Black.....Per Pound	.16	.16	.16	.16	.16	.16	.16
Price, Galv.....Per Pound	.20	.20	.20	.20	.20	.20	.20
Threads.....Per Inch	16	14	14-16	12	12-14	11	10

For classification of Malleable Iron Fittings, see page 149.
 In ordering specify Black or Galvanized.
 Order by Figure Number.

GRINNELL MALLEABLE IRON FITTINGS

Standard Pattern



Extension Piece
Fig. No. 1137



Wall Plate
Fig. No. 1138



Chandelier Loop
Male—Fig. No. 1139
Female (Not Illustrated)
Fig. No. 1139-A



Chandelier Hook, Male
Fig. No. 1140



Chandelier Hook, Female
Fig. No. 1141

EXTENSION PIECES—Fig. No. 1137

Size.....	Inches	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Price, Black.....	Each	.13	.16	.20	.25	.30	.50	.75
Price, Galv.....	Each	.19	.24	.29	.38	.45	.75	1.20

WALL PLATES—Fig. No. 1138

Size.....	Inches	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$
Price.....	Each	.11	.18	.33

CHANDELIER LOOPS AND HOOKS—Fig. Nos. 1139, 1139A, 1140, 1141

Size.....	Inches	$\frac{3}{8}$	$\frac{1}{2}$
Male Loop, Fig. No. 1139.....	Each	.11	.14
Female Loop, Fig. No. 1139-A.....	Each	.12	.14
Male Hook, Fig. No. 1140.....	Each	.13	.14
Female Hook, Fig. No. 1141.....	Each	.14	.15

For classification of Malleable Iron Fittings, see page 149.
In ordering specify Black or Galvanized.
Order by Figure Number.

GRINNELL MALLEABLE IRON FITTINGS

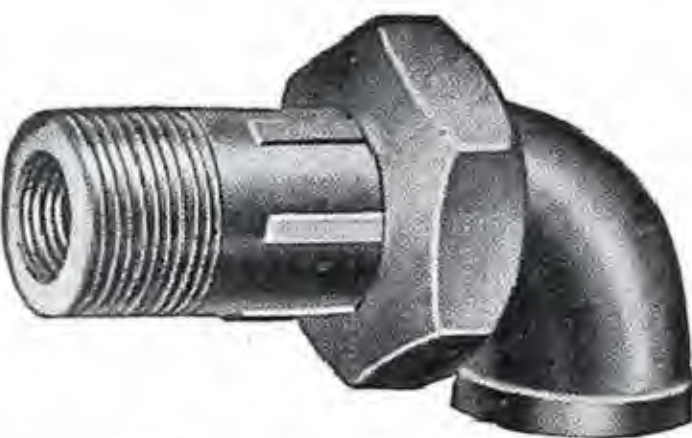
Circulating Boiler Fittings



Boiler Coupling, with Union
New Style—Fig. No. 1149



Boiler Coupling, with Union
Old Style—Fig. No. 1148-A



Boiler Elbow, with Union
New Style—Fig. No. 1150



Boiler Elbow, with Union
Old Style—Fig. No. 1147-A

LIST PRICES

Size.....Inches	Female Male 3/4x3/4x1	Female Male 3/4x1/2x1	Female Male 1/2x1/2x1
Fig. No. 1147-A Galv.....Each	.75	.75	.60
Fig. No. 1148-A Galv.....Each	.75	.75	.60
Fig. No. 1149 Galv.....Each	.75	.75	.60
Fig. No. 1150 Galv.....Each	.75	.75	.60

Boiler fittings are read as follows:

First, the female end; second, the internal thread of the male end; third, the external thread of the male end.

Order by Figure Number.



MALLEABLE IRON FITTINGS

Extra HeavyEx. Heavy Elbow
Fig. No. 1161Ex. Heavy 45° Elbow
Fig. No. 1162Ex. Heavy L. T. Elbow
Fig. No. 1163Ex. Heavy Tee
Fig. No. 1164Ex. Heavy Cross
Fig. No. 1165Ex. Heavy Coupling
Fig. No. 1166
Ex. Heavy Reducer (Not Ill.)
Fig. No. 1167

LIST PRICES

Size.....Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$
Fig. No. 1161.....Each	.20	.25	.30	.35	.40	.55	.70
Fig. No. 1162.....Each	.25	.30	.35	.42	.50	.65	.85
Fig. No. 1163.....Each	...	...	...	...	.64	.80	1.10
Fig. No. 1164.....Each	.30	.40	.45	.50	.60	.80	1.05
Fig. No. 1165.....Each	.60	.80	.90	1.00	1.20	1.60	2.10
Fig. No. 1166.....Each	.20	.25	.30	.35	.40	.55	.70
Fig. No. 1167.....Each	.20	.25	.28	.30	.40	.45	.55

Size.....Inches	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	5	6
Fig. No. 1161.....Each	.90	1.50	2.40	3.25	4.25	6.50	9.50
Fig. No. 1162.....Each	1.10	1.85	2.85	4.00	5.00	7.50	10.50
Fig. No. 1163.....Each	1.60	2.40	4.50	6.50	7.00	13.00	17.50
Fig. No. 1164.....Each	1.35	2.25	3.60	5.00	6.50	9.75	14.25
Fig. No. 1165.....Each	2.70	4.50	7.20	10.00	13.00	19.50	28.50
Fig. No. 1166.....Each	.90	1.50	2.40	3.25	4.25	6.50	9.50
Fig. No. 1167.....Each	.70	1.30	2.25	....	....	....	....

For galvanized, add 50 per cent to above list prices.

Long Turn Elbows, 45° Elbows and Crosses are not carried in stock in reducing sizes, but will be made to order at a special price, according to the quantity wanted.

For list of sizes see opposite page.

Order by Figure Number.

LIST OF SIZES

Extra Heavy Malleable Iron Fittings

Sizes not listed below made to order by bushing in the sand at special prices.

ELBOWS—STRAIGHT SIZES

$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	5	6
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ELBOWS—REDUCING SIZES

$\frac{3}{4} \times \frac{1}{2}$	$1\frac{1}{4} \times \frac{1}{2}$	$2 \times 1\frac{1}{4}$	$2\frac{1}{2} \times 2$
$1 \times \frac{3}{4}$	$1\frac{1}{2} \times 1\frac{1}{4}$	2×1	$2\frac{1}{2} \times 1\frac{1}{2}$
$1\frac{1}{4} \times 1$	$1\frac{1}{2} \times 1$	$2 \times \frac{3}{4}$	$3 \times 2\frac{1}{2}$
$1\frac{1}{4} \times \frac{3}{4}$	$2 \times 1\frac{1}{2}$	$2 \times \frac{1}{2}$	3×2

45° ELBOWS

$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	5	6
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TEES—STRAIGHT SIZES

$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	5	6
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TEES—REDUCING SIZES

$\frac{1}{2} \times \frac{3}{8} \times \frac{1}{2}$	$1\frac{1}{4} \times 1 \times 1$	$2 \times 2 \times \frac{3}{4}$	$3 \times 2 \times 3$
$\frac{3}{4} \times \frac{3}{4} \times \frac{1}{2}$	$1\frac{1}{2} \times 1\frac{1}{2} \times 1\frac{1}{4}$	$2 \times 2 \times 1\frac{1}{2}$	$4 \times 4 \times 3$
$1 \times 1 \times \frac{3}{4}$	$1\frac{1}{2} \times 1\frac{1}{2} \times 1$	$2 \times 1\frac{1}{2} \times 2$	$4 \times 4 \times 2\frac{1}{2}$
$1 \times 1 \times 1\frac{1}{2}$	$1\frac{1}{2} \times 1\frac{1}{2} \times \frac{3}{4}$	$2 \times 1 \times 2$	$4 \times 4 \times 2$
$1 \times \frac{3}{4} \times 1$	$1\frac{1}{2} \times 1\frac{1}{2} \times \frac{1}{2}$	$2\frac{1}{2} \times 2\frac{1}{2} \times 2$	$4 \times 3 \times 4$
$1\frac{1}{4} \times 1\frac{1}{4} \times 1$	$1\frac{1}{2} \times 1\frac{1}{4} \times 1\frac{1}{2}$	$2\frac{1}{2} \times 2\frac{1}{2} \times 1\frac{1}{2}$	$5 \times 5 \times 4$
$1\frac{1}{4} \times 1\frac{1}{4} \times \frac{3}{4}$	$2 \times 2 \times 1\frac{1}{2}$	$2\frac{1}{2} \times 2 \times 2\frac{1}{2}$	$6 \times 6 \times 4$
$1\frac{1}{4} \times 1\frac{1}{4} \times \frac{1}{2}$	$2 \times 2 \times 1\frac{1}{4}$	$3 \times 3 \times 2$	$6 \times 6 \times 3$
$1\frac{1}{4} \times 1 \times 1\frac{1}{4}$	$2 \times 2 \times 1$	$3 \times 3 \times 1\frac{1}{2}$	

CROSSES—STRAIGHT SIZES

$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	5	6
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LONG TURN ELBOWS—STRAIGHT SIZES

1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	5	6
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COUPLINGS

$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	5	6
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REDUCERS

$\frac{3}{4} \times \frac{1}{2}$	$1\frac{1}{4} \times \frac{1}{2}$	$1\frac{1}{2} \times \frac{1}{2}$	2×1
$1 \times \frac{3}{4}$	$1\frac{1}{2} \times 1$	$2 \times 1\frac{1}{4}$	$2 \times \frac{1}{2}$
$1\frac{1}{4} \times 1$

45° Elbows and Crosses are not carried in stock in reducing sizes, but will be made by bushing in the sand, at special prices according to the quantity wanted.

MALLEABLE IRON FITTINGS

Water Pipe or Service Clamps

With Wrought Iron Strap



Fig. No. 1168



Showing Application

CLAMPS WILL FIT						Price, Each	CLAMPS WILL FIT						Price, Each
Number	Outside Diam. of Circle, Inches	Size Wrought Pipe, Inches	Size Outside Diam. Casing, Inches	Size Cast Iron Pipe, Inches	Size of Wrought Pipe Connections Pipe Clamps Are Tapped for, Inches		Number	Outside Diam. of Circle, Inches	Size Wrought Pipe, Inches	Size Outside Diam. Casing, Inches	Size Cast Iron Pipe, Inches	Size of Wrought Pipe Connections Pipe Clamps Are Tapped for, Inches	
0	1 7/8	1 1/2	2	...	1/2, 3/4	1.00	19	6 5/8	6	6 5/8	...	3/4 to 1 1/2	2.25
1	2 3/8	2	2 1/2	...	1/2 to 1	1.00	20	6 5/8	6	6 5/8	...	2	2.50
2	2 7/8	2 1/2	2 3/4, 3	2	1, 1 1/4	1.25	21	6 5/8	6	6 5/8	...	2 1/2, 3	5.00
3	3 1/2	3	3 1/2	...	1/2 to 1	1.25	22	7	...	7	6	3/4 to 1 1/2	2.50
4	3 1/2	3	3 1/2	...	1 1/4 to 2	1.50	23	7	...	7	6	2	2.70
5	4	3 1/2	4	3	3/4, 1	1.50	24	7	...	7	6	2 1/2, 3	5.00
6	4	3 1/2	4	3	1 1/4 to 2	1.75	25	7 5/8	7	7 5/8	...	3/4 to 1 1/2	2.50
7	4 1/2	4	4 1/2	...	1/2 to 1 1/2	1.75	26	7 5/8	7	7 5/8	...	2	2.70
8	4 1/2	4	4 1/2	...	2	2.00	27	7 5/8	7	7 5/8	...	2 1/2, 3	5.00
9	4 1/2	4	4 1/2	...	2 1/2, 3	4.00	28	8	...	8	7	3/4 to 1 1/2	4.50
10	5	4 1/2	5	4	3/4 to 1 1/2	1.80	29	8	...	8	7	2	5.00
11	5	4 1/2	5	4	2	2.15	30	8	...	8	7	2 1/2, 3	5.50
12	5	4 1/2	5	4	2 1/2, 3	4.00	30 1/2	8 5/8	8	8 5/8	...	3/4 to 1 1/2	5.50
13	5 1/2	5	5 1/2	...	3/4 to 1 1/2	1.80	31	8 5/8	8	8 5/8	...	2 to 3	5.50
14	5 1/2	5	5 1/2	...	2	2.15	32	8 5/8	8	8 5/8	...	4	6.00
15	5 1/2	5	5 1/2	...	2 1/2, 3	4.00	33	9 5/8	9	...	...	1 1/2 to 3	8.00
16	6	...	6	5	1/2 to 1 1/2	2.00	34	10	...	10	9	3/4 to 2	9.00
17	6	...	6	5	2	2.40	35	10 3/4	10	...	...	3/4 to 2	9.00
18	6	...	6	5	2 1/2, 3	4.50	36	12 3/4	12	...	...	3/4 to 2	10.00

Three-inch and smaller have Wrought Iron Bands. Three and one-half inch and larger have Malleable Iron Bands.
Always order by Size and Figure Numbers.

MALLEABLE IRON FITTINGS

Steam Pipe Saddles

For Wrought Iron Pipe



Fig. No. 1169

LIST PRICES

Size of Pipe.....Inches	1½	2	2½	3	3½
Size of Pipe Saddle is tapped for, Inches	½ to ¾	½ to 1½	¾ to 1½	¾ to 2	¾ to 2
Price.....Each	.90	1.00	1.25	1.25	1.40
Size of Pipe.....Inches	4	4½	5	5	6
Size of Pipe Saddle is tapped for, Inches	¾ to 2	¾ to 2	¾ to 2	2½ to 3	¾ to 2
Price.....Each	1.50	2.50	2.75	2.75	2.75
Size of Pipe.....Inches	6	7	8	9	10
Size of Pipe Saddle is tapped for, Inches	2½ to 4	1 to 4	1 to 4	1½ to 4	1½ to 4
Price.....Each	5.75	6.50	6.50	8.50	10.00
Size of Pipe.....Inches	10	12	12	15	16
Size of Pipe Saddle is tapped for, Inches	4½ to 6	1½ to 4	4½ to 6	3 to 6	3 to 6
Price.....Each	10.00	14.00	14.00	22.00	25.00

Order by Figure Number.

RAILING FITTINGS

*Malleable Iron Fittings**Ball Pattern*

Elbow
Fig. No. 1171



45° Elbow
Fig. No. 1172



S. O. Elbow
Fig. No. 1173



Tee
Fig. No. 1174



S. O. Tee
Fig. No. 1176

LIST PRICES—STRAIGHT SIZES

Size.....Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Elbow, Fig. No. 1171... Each	.15	.18	.20	.35	.45	.72
45° Elbow, Fig. No. 1172 Each	....	....	.30	.45	.55	.90
S. O. Elbow, Fig. No. 1173 Ea.	.20	.23	.25	.40	.50	.80
Tee, Fig. No. 1174..... Each	.20	.23	.25	.40	.50	.75
S. O. Tee, Fig. No. 1176.. Each	.30	.33	.35	.45	.55	.90

For galvanized, add 50% to above lists.

Railing fittings are furnished tapped Right Hand unless otherwise specified. An additional charge will be made for fittings with R. and L. or L.H. tappings.

To avoid error a sketch should be furnished with all orders for railing fittings.

Order by Figure Number.

RAILING FITTINGS

*Malleable Iron Fittings**Ball Pattern*

Cross
Fig. No. 1177



S. O. Cross
Fig. No. 1179



Ball Ornament
Fig. No. 1180



Floor Flange
Fig. No. 1181



Floor Flange
Fig. No. 1181-A

LIST PRICES—STRAIGHT SIZES

Size.....Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Cross, Fig. No. 1177.....Each	.30	.33	.35	.45	.58	1.00
S.O. Cross, Fig. No. 1179.....Each	.35	.38	.40	.50	.65	1.35
Ball Ornament, Fig. No. 1180..Each	.16	.18	.20	.25	.35	.90
Floor Flange, Fig. No. 1181...Each	.16	.18	.20	.40	.50	.90
Floor Flange, Fig. No. 1181-A..Each	.14	.15	.15	.20	.28	.30

For galvanized, add 50% to above lists.

Railing fittings are furnished tapped Right Hand unless otherwise specified. An additional charge will be made for fittings with R. and L. or L.H. tappings.

To avoid error a sketch should be furnished with all orders for railing fittings.

Order by Figure Number.

RAILING FITTINGS

Malleable Iron Fittings

Plain Pattern



Elbow
Fig. No. 1183



Elbow, Side Outlet
Fig. No. 1184



Tee
Fig. No. 1185



Tee, Side Outlet
Fig. No. 1186



Cross
Fig. No. 1187



Floor Flange
Fig. No. 1190

LIST PRICES

Size.....Inches	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Elbow, Black.....Each	.19	.32	.55	.68	1.05
Elbow, Galvanized.....Each	.31	.53	.88	1.10	1.70
Elbow, Side Outlet, Black.....Each	.38	.51	1.10	1.10	1.65
Elbow, Side Outlet, Galv.....Each	.56	.76	1.60	1.65	2.45
Tee, Black.....Each	.27	.43	.74	.96	1.45
Tee, Galvanized.....Each	.44	.70	1.20	1.60	2.40
Tee, Side Outlet, Black.....Each	.34	.61	1.00	1.20	1.90
Tee, Side Outlet, Galv.....Each	.52	.92	1.50	1.80	2.85
Cross, Black.....Each	.48	1.00	.79	1.15	1.80
Cross, Galvanized.....Each	.73	1.50	1.30	1.90	3.00
Railing Flange, Black.....Each	.33	.42	.58	.73	.88
Railing Flange, Galv.....Each	.54	.68	.94	1.20	1.45
Diameter of Flange.....Inches	$3\frac{7}{16}$	$3\frac{7}{8}$	$4\frac{1}{4}$	$4\frac{1}{2}$	$5\frac{1}{8}$

Fittings larger than 2-inch are made to order only.

Fittings will be furnished tapped R. H. unless otherwise specified. An additional charge will be made for fittings with R. and L. or L. H. tappings.

Reducing sizes made to order at special prices.

Fittings will be reamed for slip joints when so specified at an additional price.

Order by Figure Number.

RAILING FITTINGS

*Malleable Iron Fittings**Adjustable Pattern*

Elbow
Fig. No. 1191



Tee
Fig. No. 1192



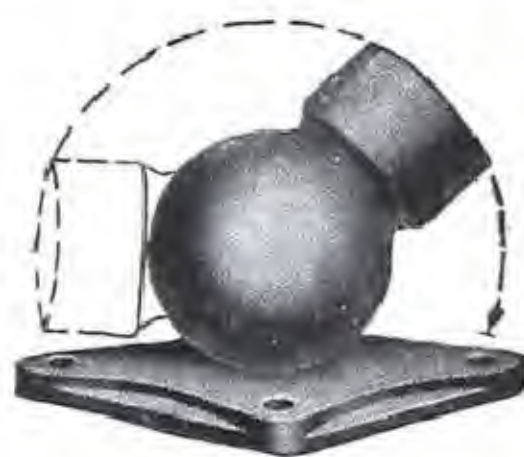
Stair Tee
Fig. No. 1193



Cross
Fig. No. 1194



Stair Cross
Fig. No. 1195



Flange
Fig. No. 1196

MALLEABLE IRON RAILING FITTINGS—ADJUSTABLE

Size.....Inches	1	1¼	1½	2
Elbow, Fig. No. 1191.....Each	1.10	1.25	1.70	2.25
Tee, Fig. No. 1192.....Each	1.30	1.50	2.00	2.50
Stair Tee, Fig. No. 1193.....Each	1.30	1.60	2.15	2.50
Cross, Fig. No. 1194.....Each	1.50	1.75	2.35	2.75
Stair Cross, Fig. No. 1195.....Each	1.50	1.85	2.50	2.75
Flange, Fig. No. 1196.....Each	1.65	1.75	1.90	2.50

These fittings can be furnished with side outlets at special prices.

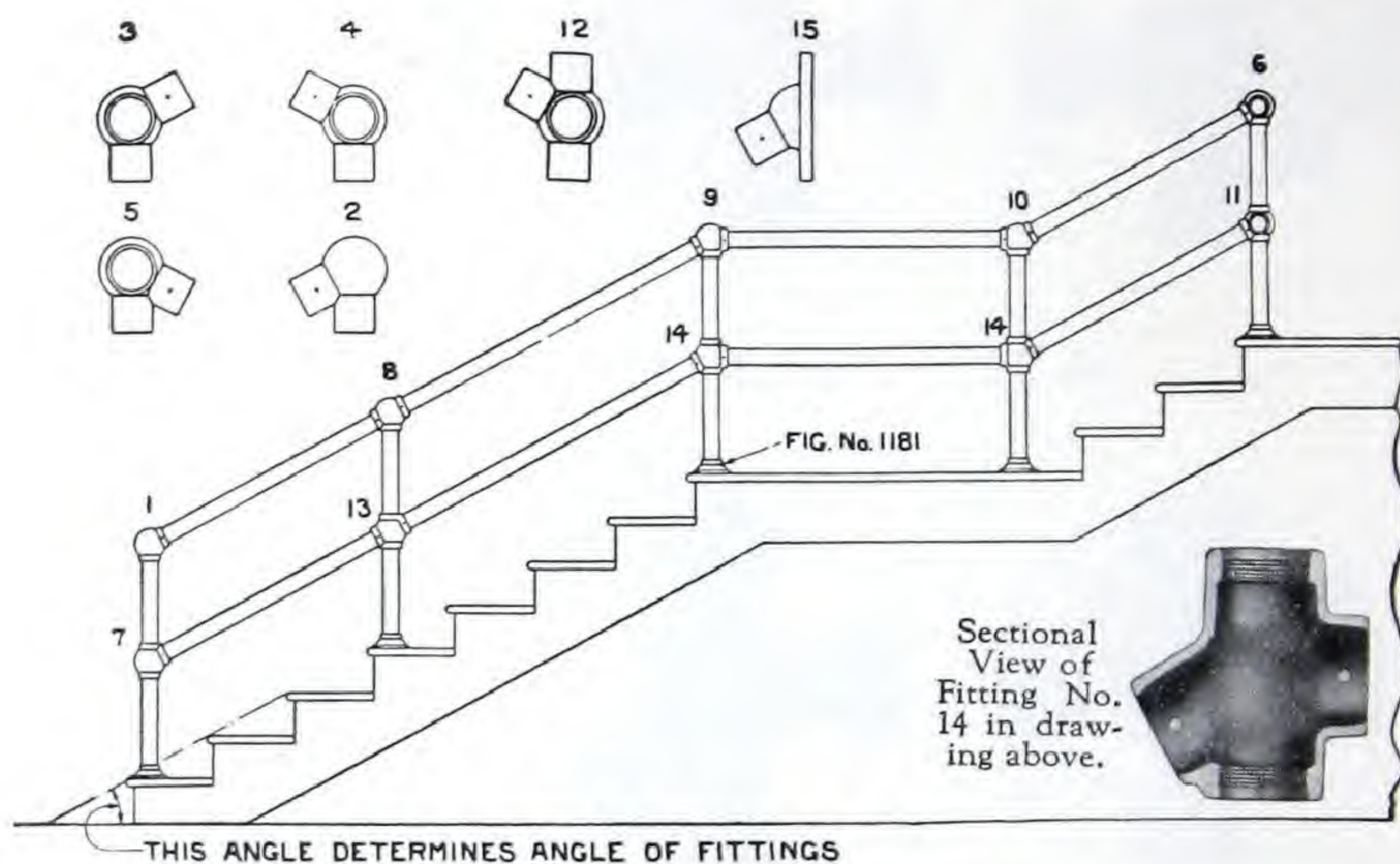
For right and left hand fittings, add 15%.

For galvanizing, add 50% to above lists.

To avoid error a sketch should be furnished with all orders for railing fittings.

Order by Figure Number.

RAILING FITTINGS

*Malleable Iron Fittings**Combination Angle—Screw and Slip Joint*

These Fittings may be used on any Stair Rail between $27\frac{1}{2}^{\circ}$ and $47\frac{1}{2}^{\circ}$.

30° Fittings—for angles between $27\frac{1}{2}^{\circ}$ and $32\frac{1}{2}^{\circ}$.

35° Fittings—for angles between $32\frac{1}{2}^{\circ}$ and $37\frac{1}{2}^{\circ}$.

40° Fittings—for angles between $37\frac{1}{2}^{\circ}$ and $42\frac{1}{2}^{\circ}$.

45° Fittings—for angles between $42\frac{1}{2}^{\circ}$ and $47\frac{1}{2}^{\circ}$.

LIST PRICES

Size.....Inches	1	1¼	1½	2
Angle Elbows, Nos. 1, 2.....Each	1.10	1.25	1.70	2.25
S. O. Angle Elbows, Nos. 3, 4, 5, 6...Each	1.65	1.95	2.70	3.35
Angle Tees, Nos. 7, 8, 9, 10.....Each	1.30	1.50	2.00	2.50
S. O. Angle Tees, Nos. 11, 12.....Each	1.85	2.20	3.00	3.60
Angle Crosses, Nos. 13, 14.....Each	1.50	1.75	2.35	2.75
Angle Flange, No. 15.....Each	1.50	1.75	1.90	2.25

The post outlets of fittings are screwed, the railing outlets are slip joints and drilled for rivets. (See sectional view of No. 14 above.)

The posts are first screwed together and the rails are then fitted and riveted.

To avoid error a sketch should be furnished with all orders for railing fittings.

Order by Style Number.

RAILING FITTINGS

Brass Railing Fittings

Ball Pattern



Elbow
Fig. No. 1201



Elbow—Side Outlet
Fig. No. 1202



Tee
Fig. No. 1203



Tee—Side Outlet
Fig. No. 1204



Cross
Fig. No. 1205



Cross—Side Outlet
Fig. No. 1206



Ball Ornament
Fig. No. 1207



Floor Flange, Square
Fig. No. 1208



Floor Flange, Round
Fig. No. 1209

LIST PRICES

Size.....Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Elbow, Fig. No. 1201 .....Each	.40	.60	.80	1.20	1.60	2.50
Elbow, S.O. Fig. No. 1202 .....Each	.75	1.00	1.10	1.70	2.00	3.00
Tee, Fig. No. 1203 .....Each	.60	.85	1.10	1.70	2.00	3.00
Tee, S.O. Fig. No. 1204 .....Each	1.05	1.25	1.50	2.00	2.40	3.50
Cross, Fig. No. 1205 .....Each	1.05	1.25	1.50	2.00	2.40	3.50
Cross, S.O. Fig. No. 1206 .....Each	1.20	1.45	1.70	2.25	3.00	4.00
Ball Ornament, Fig. No. 1207 .....Each	.75	.90	1.00	1.35	1.75	2.50
Floor Flange, Square, Fig. No. 1208 ..Each	.75	.90	1.00	1.35	1.75	2.50
Floor Flange, Round, Fig. No. 1209 ..Each	.75	.90	1.00	1.35	1.75	2.50

For R. and L. Threads add 15% to list.

Prices for sizes not listed above will be furnished on application.

To avoid error a sketch should be furnished with all orders for railing fittings.

Order by Figure Number.

BRASS AND BRONZE FITTINGS

For Standard and Extra Heavy Pressures

On the following pages we illustrate and describe a complete line of Brass and Bronze Screwed and Flanged Fittings.

STANDARD BRASS SCREWED FITTINGS

125 Lbs. Steam Working Pressure

The Standard or Malleable Pattern Brass Steam Fittings shown on pages 164 to 174, inclusive, can be furnished either Rough, Rough Tinned, Finished, or Finished and Nickel Plated, and when so ordered can be furnished in special acid resisting metal.

HEAVY BRONZE SCREWED FITTINGS

150 Lbs. Steam Working Pressure

On page 175 we illustrate and describe a line of Heavy Bronze Screwed Fittings, which are recommended for 150 Pounds Steam Working Pressure. These fittings are a high quality product, being cast from virgin metal.

EXTRA HEAVY BRONZE SCREWED FITTINGS

250 Lbs. Steam Working Pressure

The Extra Heavy Bronze Screwed Fittings shown on pages 176 to 181 are made from our 125 Pound Standard Cast Iron Patterns. These fittings are a quality product, being cast from virgin metal. They are tapped straight and accurately to gauge and chamfered permitting an easy entrance of the pipe.

We are fully equipped to cast Bronze fittings from any of our Cast Iron Patterns, either standard or extra heavy.

STANDARD BRONZE FLANGED FITTINGS

150 Lbs. Steam Working Pressure

The Standard Bronze Flanged Fittings shown on pages 182 and 183 are made from our 125 Pound Standard Cast Iron Flanged Fitting patterns. In addition to the styles and sizes illustrated we are equipped to furnish Bronze Flanged fittings from any of our Standard Flanged Fitting Patterns.

These fittings being cast from our Cast Iron fitting patterns will bear the pressure rating of the Cast Iron fitting but are entirely suitable for the pressures given.

EXTRA HEAVY BRONZE FLANGED FITTINGS

The Extra Heavy Bronze Flanged Fittings shown on pages 184 and 185 are made from our 250 Pounds Extra Heavy Cast Iron Flanged Fitting patterns. We are also equipped to furnish Bronze Flanged Fittings from any of our Extra Heavy Cast Iron Flanged Fitting patterns.

ACID RESISTING BRONZE FITTINGS

We can furnish on order fittings cast from special acid resisting metal in Standard, Heavy or Extra Heavy screwed fitting patterns or Standard and Extra Heavy Flanged Fitting patterns at special prices according to the quantity wanted.

Grinnell Bronze Fittings being cast from virgin metal are of necessity a high quality product. Grinnell workmanship and finesse is evident in this line and we honestly believe no better product is available.

BRASS STEAM FITTINGS

Standard Pattern—Iron Pipe Size

125 Lbs. Steam Pressure



Elbow, Straight
Fig. No. 1211



Elbow, Reducing
Fig. No. 1212

ELBOWS, STRAIGHT—Fig. No. 1211

Size.....Inches	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$
Price, Rough.....Each	.12	.15	.20	.28	.40	.63	.90
Price, Rough, Tinned.....Each	.22	.25	.33	.43	.60	.93	1.25
Price, Finished.....Each	.30	.35	.45	.56	.75	1.10	1.55
Price, Finished and N. P.....Each	.36	.42	.53	.65	.87	1.25	1.75

Size.....Inches	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4
Price, Rough.....Each	1.20	2.00	3.50	6.00	8.00	10.00
Price, Rough, Tinned.....Each	1.60	2.60	4.30	7.50	10.00	12.50
Price, Finished.....Each	2.00	3.00	5.50	9.00	14.00	17.50
Price, Finished and N. P.....Each	2.25	3.35	6.15	10.00	16.00	20.00

ELBOWS, REDUCING—Fig. No. 1212

Size.....Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$
Price, Rough.....Each	.19	.25	.35	.50	.80	1.10
Price, Rough, Tinned.....Each	.29	.38	.50	.70	1.10	1.45
Price, Finished.....Each	.44	.55	.70	.95	1.40	1.90
Price, Finished and N. P.....Each	.52	.65	.82	1.10	1.60	2.15

Size.....Inches	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4
Price, Rough.....Each	1.50	2.50	4.25	7.50	10.00	12.50
Price, Rough, Tinned.....Each	1.90	3.10	5.00	9.00	12.00	15.00
Price, Finished.....Each	2.50	3.75	6.75	11.25	17.50	22.00
Price, Finished and N. P.....Each	2.85	4.15	7.60	12.50	20.00	25.00

For Right and Left Elbows, add 25% to above list prices.
Specify finish when ordering.
Order by Figure Number.

BRASS STEAM FITTINGS
Standard Pattern—Iron Pipe Size
 125 Lbs. Steam Pressure



45° Angle Elbow
 Fig. No. 1213



Elbow, Side Outlet
 Fig. No. 1214

45° ANGLE ELBOW—Fig. No. 1213

Size.....Inches	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$
Price, Rough.....Each	.16	.20	.25	.31	.40	.63	.90
Price, Rough, Tinned.....Each	.26	.30	.38	.46	.60	.93	1.25
Price, Finished.....Each	.38	.45	.55	.66	.85	1.23	1.70
Price, Finished and N. P.....Each	.45	.53	.65	.78	1.00	1.43	1.95

Size.....Inches	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4
Price, Rough.....Each	1.20	2.00	3.50	6.00	8.00	10.00
Price, Rough, Tinned.....Each	1.60	2.60	4.30	7.50	10.00	12.50
Price, Finished.....Each	2.20	3.25	6.00	9.75	15.50	19.50
Price, Finished and N. P.....Each	2.55	3.65	6.85	11.00	18.00	22.50

ELBOW, SIDE OUTLET—Fig. No. 1214

Size.....Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1
Price, Rough.....Each	.45	.60	.85	1.20	1.90
Price, Rough, Tinned.....Each	.57	.75	1.05	1.45	2.25
Price, Finished.....Each	1.05	1.35	1.70	2.25	3.30
Price, Finished and N. P.....Each	1.25	1.60	2.00	2.60	3.75

Size.....Inches	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Price, Rough.....Each	2.75	3.60	6.00	10.50	18.00
Price, Rough, Tinned.....Each	3.20	4.10	6.75	11.50	19.85
Price, Finished.....Each	4.70	6.00	9.00	16.50	27.00
Price, Finished and N. P.....Each	5.35	6.80	10.00	18.50	30.00

Specify finish when ordering.
 Order by Figure Number.

BRASS STEAM FITTINGS

Standard Pattern—Iron Pipe Size

125 Lbs. Steam Pressure



Tee, Straight
Fig. No. 1215



Tee, Reducing
Fig. No. 1216



Tee, Side Outlet
Fig. No. 1217

TEES, STRAIGHT—Fig. No. 1215

Size.....Inches	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$
Price, Rough.....Each	.17	.21	.28	.40	.55	.85	1.25
Price, Rough Tinned.....Each	.29	.33	.43	.60	.80	1.20	1.70
Price, Finished.....Each	.42	.49	.63	.80	1.05	1.50	2.15
Price, Finished and N. P.....Each	.50	.58	.75	.93	1.22	1.70	2.45

Size.....Inches	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4
Price, Rough.....Each	1.70	2.80	5.00	8.50	11.00	14.00
Price, Rough Tinned.....Each	2.20	3.55	6.00	10.35	13.50	17.00
Price, Finished.....Each	2.80	4.20	7.75	12.75	19.50	24.50
Price, Finished and N. P.....Each	3.15	4.65	8.65	14.00	22.30	28.00

TEES, REDUCING—Fig. No. 1216

Size.....Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$
Price, Rough.....Each	.25	.35	.50	.70	1.05	1.55
Price, Rough Tinned.....Each	.37	.50	.70	.95	1.40	2.00
Price, Finished.....Each	.60	.77	1.00	1.30	1.85	2.65
Price, Finished and N. P.....Each	.72	.90	1.15	1.50	2.10	3.00

Size.....Inches	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4
Price, Rough.....Each	2.10	3.50	6.25	10.50	14.00	17.50
Price, Rough Tinned.....Each	2.60	4.25	7.25	12.35	16.50	20.50
Price, Finished.....Each	3.50	5.25	9.75	15.80	24.50	30.50
Price, Finished and N. P.....Each	3.95	5.85	10.90	17.50	28.00	35.00

TEES, SIDE OUTLET—Fig. No. 1217

Size.....Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Price, Rough.....Each	1.20	1.65	2.50	3.75	5.00	8.50
Price, Rough Tinned.....Each	1.45	1.95	2.95	4.30	5.60	9.40
Price, Finished.....Each	2.05	2.70	3.90	5.70	7.40	11.50
Price, Finished and N. P.....Each	2.35	3.05	4.35	6.35	8.20	12.50

Specify finish when ordering.
Order by Figure Number.

BRASS STEAM FITTINGS

*Standard Pattern—Iron Pipe Size**125 Lbs. Steam Pressure*Cross, Straight
Fig. No. 1218Cross, Reducing
Fig. No. 1219

CROSSES, STRAIGHT—Fig. No. 1218

Size.....Inches	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$
Price, Rough.....Each	.25	.30	.40	.55	.80	1.25	1.80
Price, Rough Tinned.....Each	.40	.45	.60	.80	1.10	1.70	2.35
Price, Finished.....Each	.60	.70	.90	1.10	1.50	2.20	3.10
Price, Finished and N. P.....Each	.72	.84	1.05	1.30	1.75	2.50	3.50

Size.....Inches	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4
Price, Rough.....Each	2.40	4.00	7.00	12.00	16.00	20.00
Price, Rough Tinned.....Each	3.00	4.90	8.20	14.25	19.00	23.75
Price, Finished.....Each	4.00	6.00	11.00	18.00	28.00	35.00
Price, Finished and N. P.....Each	4.50	6.70	12.30	20.00	32.00	40.00

CROSSES, REDUCING—Fig. No. 1219

Size.....Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$
Price, Rough.....Each	.38	.50	.70	1.00	1.55	2.25
Price, Rough Tinned.....Each	.53	.70	.95	1.30	2.00	2.80
Price, Finished.....Each	.88	1.10	1.40	1.85	2.75	3.85
Price, Finished and N. P.....Each	1.05	1.30	1.65	2.15	3.15	4.35

Size.....Inches	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4
Price, Rough.....Each	3.00	5.00	8.75	15.00	20.00	25.00
Price, Rough Tinned.....Each	3.60	5.90	10.00	17.25	23.00	28.75
Price, Finished.....Each	5.00	7.50	13.75	22.50	35.00	44.00
Price, Finished and N. P.....Each	5.70	8.30	15.40	25.00	40.00	50.00

Specify finish when ordering.
Order by Figure Number.

BRASS STEAM FITTINGS

Standard Pattern—Iron Pipe Size

125 Lbs. Steam Pressure



Y-Branch or Lateral
Fig. No. 1220



Reducer
Fig. No. 1221

Y-BRANCHES OR LATERALS—Fig. No. 1220

Size.....Inches	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$
Price, Rough.....Each	.60	.75	1.10	1.65	2.50	3.30
Price, Rough Tinned.....Each	.85	1.05	1.50	2.25	3.20	4.10
Price, Finished.....Each	1.35	1.60	2.15	3.05	4.45	5.70
Price, Finished and N. P.....Each	1.60	1.90	2.50	3.50	5.10	6.50

Size.....Inches	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4
Price, Rough.....Each	5.50	9.50	16.00	21.00	26.00
Price, Rough Tinned.....Each	6.70	11.00	19.00	25.00	31.00
Price, Finished.....Each	8.50	15.50	25.00	33.00	41.00
Price, Finished and N. P.....Each	9.50	17.50	28.00	37.00	46.00

REDUCERS—Fig. No. 1221

Size.....Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$
Price, Rough.....Each	.15	.20	.28	.40	.60	.90
Price, Rough Tinned.....Each	.25	.33	.43	.60	.90	1.25
Price, Finished.....Each	.35	.45	.56	.75	1.05	1.55
Price, Finished and N. P.....Each	.42	.53	.65	.87	1.20	1.75

Size.....Inches	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4
Price, Rough.....Each	1.10	1.75	2.75	4.00	6.00	8.00
Price, Rough Tinned.....Each	1.50	2.35	3.55	5.50	8.00	10.50
Price, Finished.....Each	1.90	2.75	4.75	7.00	12.00	15.50
Price, Finished and N. P.....Each	2.15	3.10	5.40	8.00	14.00	18.00

For Reducers, reducing more than two sizes, add 25% to above list prices.
Specify finish when ordering.
Order by Figure Number.

BRASS STEAM FITTINGS

*Standard Pattern—Iron Pipe Size**125 Lbs. Steam Pressure*Coupling, R. H.
Fig. No. 1222Coupling, R. and L.
Fig. No. 1223

COUPLINGS, R. H.—Fig. No. 1222

Size.....Inches	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$
Price, Rough.....Each	.10	.13	.17	.25	.37	.55	.80
Price, Rough Tinned.....Each	.20	.23	.30	.40	.57	.85	1.15
Price, Finished.....Each	.24	.28	.36	.46	.63	.90	1.30
Price, Finished and N. P.....Each	.29	.33	.42	.53	.72	1.00	1.45

Size.....Inches	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4
Price, Rough.....Each	1.00	1.60	2.50	3.50	5.25	7.00
Price, Rough Tinned.....Each	1.40	2.20	3.30	5.00	7.25	9.50
Price, Finished.....Each	1.60	2.35	4.00	5.75	9.75	12.50
Price, Finished and N. P.....Each	1.80	2.60	4.50	6.50	11.25	14.25

COUPLINGS, R. and L.—Fig. No. 1223

Size.....Inches	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1
Price, Rough.....Each	.13	.17	.22	.30	.45	.70
Price, Rough Tinned.....Each	.23	.27	.35	.45	.65	1.00
Price, Finished.....Each	.31	.37	.47	.58	.80	1.15
Price, Finished and N. P.....Each	.37	.44	.55	.67	.92	1.30

Size.....Inches	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Price, Rough.....Each	1.00	1.30	2.00	3.10	4.50
Price, Rough Tinned.....Each	1.35	1.70	2.60	3.90	6.00
Price, Finished.....Each	1.65	2.10	3.00	5.10	7.50
Price, Finished and N. P.....Each	1.85	2.35	3.35	5.75	8.50

Specify finish when ordering.
Order by Figure Number.

BRASS STEAM FITTINGS

Standard Pattern—Iron Pipe Size

125 Lbs. Steam Pressure



Street Elbow
Fig. No. 1224



Drop Elbow
Fig. No. 1225

STREET ELBOWS—Fig. No. 1224

Size.....Inches	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Price, Rough.....Each	.25	.27	.33	.48	.63	.85	1.15
Price, Rough Tinned.....Each	.35	.37	.46	.63	.83	1.08	1.45
Price, Finished.....Each	.47	.52	.63	.83	1.08	1.45	1.65
Price, Finished and N. P.....Each	.54	.60	.73	.95	1.23	1.65	2.00

Size.....Inches	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Price, Rough.....Each	1.50	2.00	3.25	6.00	10.00
Price, Rough Tinned.....Each	1.85	2.40	3.85	6.80	11.50
Price, Finished.....Each	2.30	3.00	4.50	8.50	13.75
Price, Finished and N. P.....Each	2.55	3.35	4.90	9.35	15.00

DROP ELBOWS—Fig. No. 1225

Size.....Inches	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Price, Rough.....Each	.35	.45	.65	1.05	1.50	2.00	3.40
Price, Rough Tinned.....Each	.50	.65	.90	1.40	1.95	2.50	4.15
Price, Finished.....Each	.85	1.05	1.40	2.00	2.80	3.60	5.40
Price, Finished and N. P.....Each	1.00	1.25	1.65	2.30	3.20	4.10	6.00

Specify finish when ordering.
Order by Figure Number.

BRASS STEAM FITTINGS

Standard Pattern—Iron Pipe Size

125 Lbs. Steam Pressure



Drop Tee, Single Ear
Fig. No. 1226



Drop Tee, Double Ear
Fig. No. 1227

DROP TEES, SINGLE EAR—Fig. No. 1226

Size.....Inches	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Price, Rough.....Each	.43	.57	.80	1.25	1.85	2.50	4.20
Price, Rough Tinned.....Each	.63	.82	1.10	1.70	2.40	3.10	5.10
Price, Finished.....Each	1.13	1.37	1.80	2.55	3.65	4.70	7.00
Price, Finished and N. P.....Each	1.33	1.62	2.15	2.95	4.25	5.45	7.90

DROP TEES, DOUBLE EAR—Fig. No. 1227

Size.....Inches	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Price, Rough.....Each	.58	.74	1.05	1.70	2.45	3.30	5.60
Price, Rough Tinned.....Each	.78	1.00	1.35	2.15	3.00	3.90	6.50
Price, Finished.....Each	1.28	1.54	2.05	3.00	4.25	5.50	8.40
Price, Finished and N. P.....Each	1.48	1.80	2.40	3.40	4.85	6.25	9.30



BRASS CAPS—Fig. No. 1228

Size.....Inches	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$
Price, Rough.....Each	.10	.13	.16	.20	.30	.42	.60
Price, Rough Tinned.....Each	.15	.18	.22	.28	.40	.57	.80
Price, Finished.....Each	.20	.25	.31	.40	.55	.77	1.10
Price, Finished and N. P.....Each	.23	.29	.36	.47	.63	.89	1.25

Size.....Inches	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4
Price, Rough.....Each	.80	1.25	2.50	3.50	5.50	7.00
Price, Rough Tinned.....Each	1.00	1.55	2.90	4.25	6.50	8.25
Price, Finished.....Each	1.50	2.25	4.00	5.50	8.00	10.00
Price, Finished and N. P.....Each	1.75	2.60	4.50	6.15	8.85	11.00

Specify finish when ordering.
Order by Figure Number.

BRASS STEAM FITTINGS
Standard Pattern—Iron Pipe Size

125 Lbs. Steam Pressure



Bushing
Fig. No. 1229



Face Bushing
Fig. No. 1230

BUSHINGS—Fig. No. 1229

Size.....Inches	1/4	3/8	1/2	3/4	1	1 1/4
Price, Rough.....Each	.10	.12	.15	.22	.35	.50
Price, Rough Tinned.....Each	.15	.18	.23	.32	.50	.68
Price, Finished.....Each	.22	.27	.35	.47	.70	1.00
Price, Finished and N. P.....Each	.26	.32	.42	.55	.82	1.15

Size.....Inches	1 1/2	2	2 1/2	3	3 1/2	4
Price, Rough.....Each	.70	1.00	1.50	2.50	3.75	5.00
Price, Rough Tinned.....Each	.90	1.30	1.90	3.25	4.75	6.25
Price, Finished.....Each	1.40	2.00	3.00	4.50	6.25	8.00
Price, Finished and N. P.....Each	1.65	2.35	3.50	5.15	7.10	9.00

FACE BUSHINGS—Fig. No. 1230

Size.....Inches	1/4	3/8	1/2	3/4	1	1 1/4
Price, Rough.....Each	.12	.15	.19	.27	.44	.62

Size.....Inches	1 1/2	2	2 1/2	3	3 1/2	4
Price, Rough.....Each	.87	1.25	1.85	3.10	4.75	6.25



LOCKNUTS—Fig. No. 1231

Size.....Inches	1/8	1/4	3/8	1/2	3/4	1	1 1/4
Price, Rough.....Each	.10	.10	.12	.15	.20	.28	.40
Price, Rough Tinned.....Each	.15	.15	.18	.23	.30	.43	.60
Price, Finished.....Each	.24	.25	.32	.40	.50	.65	.85
Price, Finished and N. P.....Each	.29	.30	.39	.48	.60	.77	1.00

Size.....Inches	1 1/2	2	2 1/2	3	3 1/2	4	.....
Price, Rough.....Each	.55	.80	1.75	2.75	4.00	5.00	.....
Price, Rough Tinned.....Each	.75	1.10	2.15	3.50	5.00	6.25	.....
Price, Finished.....Each	1.10	1.60	3.25	4.75	6.50	8.00	.....
Price, Finished and N. P.....Each	1.30	1.85	3.75	5.40	7.35	9.00	.....

For Bushings reducing more than two sizes, add 25% to above list prices.
Specify finish when ordering.
Order by Figure Number.

BRASS STEAM FITTINGS

Standard Pattern—Iron Pipe Size

125 Lbs. Steam Pressure



Plug
Fig. No. 1232



Solid Plug
Fig. No. 1233



Countersunk Plug
Fig. No. 1234

PLUG—Fig. No. 1232

Size.....Inches	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$
Price, Rough.....Each	.08	.10	.12	.15	.20	.30	.45
Price, Rough Tinned.....Each	.13	.15	.18	.23	.30	.45	.63
Price, Finished.....Each	.23	.30	.37	.43	.55	.75	1.00
Price, Finished and N. P.....Each	.28	.37	.45	.52	.67	.90	1.20

Size.....Inches	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	.....
Price, Rough.....Each	.60	.95	1.50	2.25	3.75	5.00	.....
Price, Rough Tinned.....Each	.80	1.25	1.90	3.00	4.75	6.25	.....
Price, Tinned.....Each	1.30	1.95	3.00	4.25	6.25	8.00	.....
Price, Finished and N. P.....Each	1.55	2.30	3.50	4.90	7.10	9.00	.....

SOLID PLUG—Fig. No. 1233

Size.....Inches	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$
Price, Rough.....Each	.18	.22	.30	.45	.80	1.20
Price, Rough Tinned.....Each	.24	.30	.40	.60	1.00	1.40
Price, Finished.....Each	.43	.50	.65	.90	1.35	1.90
Price, Finished and N. P.....Each	.51	.59	.77	1.05	1.55	2.15

Size.....Inches	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	.....
Price, Rough.....Each	1.90	3.00	4.50	7.50	10.00	.....
Price, Rough Tinned.....Each	2.20	3.40	5.25	8.50	11.25	.....
Price, Finished.....Each	2.90	4.50	6.50	10.00	13.00	.....
Price, Finished and N. P.....Each	3.25	5.00	7.15	10.85	14.00	.....

COUNTERSUNK PLUG—Fig. No. 1234

Size.....Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Price, Rough.....Each	.22	.30	.45	.65	.90	1.40
Price, Rough Tinned.....Each	.30	.40	.60	.85	1.10	1.70
Price, Finished.....Each	.42	.55	.80	1.15	1.55	2.25
Price, Finished and N. P.....Each	.49	.63	.92	1.30	1.75	2.55

Specify finish when ordering.
Order by Figure Number.

BRASS STEAM FITTINGS

Standard Pattern—Iron Pipe Size

125 Lbs. Steam Pressure



Return Bend, Close Pattern
Fig. No. 1235



Return Bend, Open Pattern
Fig. No. 1236

RETURN BENDS, CLOSE PATTERN—Fig. No. 1235

Size.....Inches	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1
Price, Rough.....Each	.30	.40	.55	.70	1.00	1.25
Price, Rough Tinned.....Each	.50	.60	.80	1.00	1.40	1.85
Price, Finished.....Each	.85	1.00	1.30	1.55	2.05	2.65
Price, Finished and N. P.....Each	1.05	1.20	1.55	1.85	2.40	3.10

Size.....Inches	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	....
Price, Rough.....Each	1.80	2.50	4.25	7.00	10.00	....
Price, Rough Tinned.....Each	2.50	3.30	5.45	8.60	13.00	....
Price, Finished.....Each	3.75	4.90	7.25	13.00	19.00	....
Price, Finished and N. P.....Each	4.40	5.70	8.25	15.00	22.00	....

RETURN BENDS, OPEN PATTERN—Fig. No. 1236

Size.....Inches	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1
Price, Rough.....Each	.40	.50	.60	.80	1.10	1.40
Price, Rough Tinned.....Each	.60	.70	.85	1.10	1.50	2.00
Price, Finished.....Each	.95	1.10	1.35	1.65	2.15	2.80
Price, Finished and N. P.....Each	1.15	1.30	1.60	1.95	2.50	3.25

Size.....Inches	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	....
Price, Rough.....Each	2.15	3.00	4.75	8.25	11.00	....
Price, Rough Tinned.....Each	2.85	3.80	5.95	9.85	14.00	....
Price, Finished.....Each	4.10	5.40	7.75	14.25	20.00	....
Price, Finished and N. P.....Each	4.75	6.20	8.75	16.25	23.00	....

For Right and Left Return Bends, add 25% to above list prices.
Specify finish when ordering.
Order by Figure Number.

HEAVY BRONZE STEAM FITTINGS

*Malleable Pattern—Iron Pipe Size**150 Lbs. Steam Pressure*

Elbow



45° Elbow



Tee

The Heavy Pattern Bronze Screwed Fittings are of an exceptionally high grade. They are made from virgin metal and are therefore slightly more expensive than ordinary Standard Brass Screwed Fittings.

The same high class of workmanship and finish of our Cast Iron Fittings is evident in this line and we unhesitatingly recommend their use, where a quality product is desired. These fittings are tapped straight and true and are threaded accurately to gauge.

The List Prices are the same as those for Standard Brass Screwed Fittings with a special discount applying.

We can furnish these fittings on order, cast from special Acid Resisting Bronze at special prices according to the quantity ordered.

GRINNELL EXTRA HEAVY BRONZE FITTINGS

Cast Iron Pattern

Iron Pipe Size

*For Saturated Steam Working Pressures up to 250 Pounds.
For Superheated Steam Working Pressures up to 250 Pounds and a
Total Temperature not Exceeding 500 Degrees Fahrenheit.*



Elbow, R. H.
Fig. No. 1271



Elbow, R. and L.
Fig. No. 1272

ELBOWS, R. H.—Fig. No 1271

Size.....Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Rough.....	.33	.45	.65	1.00	1.50	2.25	3.00	4.50
Rough Tinned.....	.48	.65	.90	1.30	1.95	2.75	3.65	5.40
Polished.....	.73	.95	1.25	1.75	2.50	3.50	4.50	6.25

Size.....Inches	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	6	.....
Rough.....	8.00	11.25	16.00	22.00	27.00	35.00	45.00	.....
Rough Tinned.....	9.50	13.25	18.75	25.50	31.50	41.00	52.50	.....
Polished.....	10.50	14.75	23.50	31.00	38.00	48.00	60.00	.....

ELBOWS, R. AND L.—Fig. No. 1272

Size.....Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1
Rough.....	.40	.55	.75	1.20	1.80
Rough Tinned.....	.55	.75	1.00	1.50	2.25
Polished.....	.90	1.15	1.50	2.10	3.00

Size.....Inches	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Rough.....	2.60	3.50	5.25	9.00	13.00
Rough Tinned.....	3.10	4.15	6.15	10.50	15.00
Polished.....	4.10	5.35	7.50	12.00	17.25

Extra Heavy Bronze Fittings are made from Standard 125 Pound Cast Iron Patterns.

For dimensions, see pages 63 to 91.

Sizes not listed above made to order at special prices.

Bronze Fittings cast from our Extra Heavy Cast Iron Patterns, made to order at special prices.

Specify finish when ordering.

Order by Figure Number.

GRINNELL EXTRA HEAVY BRONZE FITTINGS

Cast Iron Pattern—Iron Pipe Size

For Saturated Steam Working Pressures up to 250 Pounds.
For Superheated Steam Working Pressures up to 250 Pounds and a
Total Temperature not Exceeding 500 Degrees Fahrenheit.



Elbow, Reducing
Fig. No. 1273



45° Elbow
Fig. No. 1274

ELBOWS, REDUCING—Fig. No. 1273

Size.....Inches	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Rough.....	.55	.75	1.20	1.80	2.60	3.50	5.25
Rough Tinned.....	.75	1.00	1.50	2.25	3.10	4.15	6.15
Polished.....	1.15	1.50	2.10	3.00	4.10	5.35	7.50

Size.....Inches	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	6
Rough.....	9.00	13.00	19.00	25.00	30.00	40.00	50.00
Rough Tinned.....	10.50	15.00	21.75	28.50	34.50	46.00	57.50
Polished.....	12.00	17.25	28.00	36.00	43.75	56.00	70.00

45° ELBOWS—Fig. No. 1274

Size.....Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Rough.....	.45	.55	.75	1.10	1.65	2.50	3.25	4.50
Rough Tinned.....	.60	.75	1.00	1.40	2.10	3.00	3.90	5.40
Polished.....	.95	1.15	1.50	2.00	2.85	4.00	5.10	6.75

Size.....Inches	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	6	.....
Rough.....	8.00	11.25	16.00	22.00	27.00	35.00	45.00	.....
Rough Tinned.....	9.50	13.25	18.75	25.50	31.50	41.00	52.50	.....
Polished.....	11.00	15.50	25.00	33.00	40.75	51.00	65.00	.....

Extra Heavy Bronze Fittings are made from Standard 125 Pound Cast Iron Patterns.

For dimensions, see pages 63 to 91.

Sizes not listed above made to order at special prices.

Bronze Fittings cast from our Extra Heavy Cast Iron Patterns, made to order at special prices.

Specify finish when ordering.

Order by Figure Number.

GRINNELL EXTRA HEAVY BRONZE FITTINGS

Cast Iron Pattern—Iron Pipe Size

*For Saturated Steam Working Pressures up to 250 Pounds.
For Superheated Steam Working Pressures up to 250 Pounds and a
Total Temperature not Exceeding 500 Degrees Fahrenheit.*



Tee, Straight
Fig. No. 1275



Tee, Reducing
Fig. No. 1276

TEES, STRAIGHT—Fig. No. 1275

Size.....Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Rough.....	.45	.60	.90	1.35	2.00	3.00	4.00	6.00
Rough Tinned.....	.65	.85	1.25	1.75	2.60	3.70	4.85	7.25
Polished.....	1.00	1.25	1.70	2.35	3.35	4.65	6.00	8.35
Size.....Inches	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	6	.....
Rough.....	10.75	15.00	22.00	30.00	36.00	46.00	60.00	.....
Rough Tinned.....	12.75	17.75	26.00	34.50	42.00	54.00	70.00	.....
Polished.....	14.00	19.75	32.00	42.00	51.00	64.00	80.00	.....

TEES, REDUCING—Fig. No. 1276

Size.....Inches	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Rough.....	.70	1.05	1.55	2.30	3.50	4.50	6.75
Rough Tinned.....	.95	1.40	1.95	2.90	4.20	5.35	8.00
Polished.....	1.50	2.05	2.80	4.00	5.50	7.00	9.75
Size.....Inches	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	6
Rough.....	12.00	17.00	25.00	35.00	40.00	51.00	66.00
Rough Tinned.....	14.00	19.75	29.00	39.50	46.00	59.00	76.00
Polished.....	16.00	23.00	37.00	50.00	58.00	70.00	90.00

Extra Heavy Bronze Fittings are made from Standard 125 Pound Cast Iron Patterns.
For dimensions, see pages 63 to 91.

Sizes not listed above made to order at special prices.

Bronze Fittings cast from our Extra Heavy Cast Iron Patterns, made to order at special prices.

Specify finish when ordering.

Order by Figure Number.

GRINNELL EXTRA HEAVY BRONZE FITTINGS

Cast Iron Pattern

Iron Pipe Size

For Saturated Steam Working Pressures up to 250 Pounds.
 For Superheated Steam Working Pressures up to 250 Pounds and a
 Total Temperature not Exceeding 500 Degrees Fahrenheit.



Cross, Straight
 Fig. No. 1277



Cross, Reducing
 Fig. No. 1278

CROSSES, STRAIGHT—Fig. No. 1277

Size.....Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Rough.....Each	.70	.90	1.30	2.00	3.00	4.50	6.00	9.00
Rough Tinned.....Each	.95	1.25	1.75	2.50	3.75	5.35	7.00	10.50
Polished.....Each	1.50	1.90	2.50	3.50	5.00	7.00	9.00	12.50

Size.....Inches	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	6	.....
Rough.....Each	16.00	22.50	28.00	37.00	45.00	60.00	75.00	.....
Rough Tinned.....Each	18.25	25.75	33.00	43.00	52.00	70.00	87.50	.....
Polished.....Each	21.00	29.50	43.00	55.00	67.00	85.00	105.00	.....

CROSSES, REDUCING—Fig. No. 1278

Size.....Inches	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Rough.....Each	1.10	1.50	2.40	3.60	5.25	7.00	10.50
Rough Tinned.....Each	1.45	1.95	2.90	4.35	6.10	8.00	12.00
Polished.....Each	2.35	3.00	4.25	6.00	8.25	10.75	15.00

Size.....Inches	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	6
Rough.....Each	18.00	26.00	32.00	42.00	50.00	66.00	82.00
Rough Tinned.....Each	20.25	29.25	37.00	48.00	57.00	76.00	94.50
Polished.....Each	24.00	35.00	50.00	64.00	75.00	95.00	120.00

Extra Heavy Bronze Fittings are made from Standard 125 Pound Cast Iron Patterns.

For dimensions see pages 63 to 91.

Sizes not listed above made to order at special prices.

Bronze Fittings cast from our Extra Heavy Cast Iron Patterns, made to order at special prices.

Specify finish when ordering.

Order by Figure Number.

GRINNELL EXTRA HEAVY BRONZE FITTINGS

Cast Iron Pattern

Iron Pipe Size

For Saturated Steam Working Pressures up to 250 Pounds.
For Superheated Steam Working Pressures up to 250 Pounds and a
Total Temperature not Exceeding 500 Degrees Fahrenheit.



Y-Branch or Lateral
Fig. No. 1279



Coupling
Fig. No. 1280
†Reducing Coupling (Not Ill.)
Fig. No. 1281

Y-BRANCHES OR LATERALS—Fig. No. 1279

Size.....Inches	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2
Rough.....Each	.90	1.10	1.50	2.50	3.50	5.50	7.25	11.00
Rough Tinned.....Each	1.20	1.50	2.00	3.10	4.35	6.50	8.50	12.75
Polished.....Each	1.70	2.10	2.70	4.00	5.50	8.00	10.25	14.50

Size.....Inches	2 1/2	3	3 1/2	4	4 1/2	5	6	.....
Rough.....Each	19.00	27.00	33.00	45.00	55.00	70.00	90.00	.....
Rough Tinned.....Each	21.75	31.00	38.00	52.00	64.00	82.00	105.00	.....
Polished.....Each	24.00	34.00	48.00	63.00	77.00	96.00	120.00	.....

COUPLINGS—Fig. No. 1280

Size.....Inches	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2
Rough.....Each	.40	.50	.70	1.10	1.65	2.25	3.00	4.50
Rough Tinned.....Each	.50	.65	.90	1.35	2.00	2.65	3.50	5.25
Polished.....Each	.75	.90	1.15	1.70	2.40	3.20	4.15	5.85

Size.....Inches	2 1/2	3	3 1/2	4	4 1/2	5	6	.....
Rough.....Each	7.00	10.00	13.00	17.00	21.00	27.00	35.00	.....
Rough Tinned.....Each	8.00	11.50	15.00	19.50	24.00	31.00	40.00	.....
Polished.....Each	9.00	13.00	18.50	24.00	29.00	37.00	47.00	.....

†Reducing Couplings, reducing two sizes and less, add 20% to Straight Coupling list.
Reducing more than two sizes, add 40%.
Extra Heavy Bronze Fittings are made from Standard 125 Pound Cast Iron Patterns.
For dimensions, see pages 63 to 91.
Sizes not listed above made to order at special prices.
Bronze Fittings cast from our Extra Heavy Cast Iron Patterns, made to order at special prices.
Specify finish when ordering.
Order by Figure Number.

GRINNELL EXTRA HEAVY BRONZE FITTINGS

Cast Iron Pattern—Iron Pipe Size

For Saturated Steam Working Pressures up to 250 Pounds.

For Superheated Steam Working Pressures up to 250 Pounds and a
Total Temperature not Exceeding 500 Degrees Fahrenheit



Return Bend, Close Pattern
Fig. No. 1282



Return Bend, Open Pattern
Fig. No. 1283

RETURN BENDS, CLOSE PATTERN—Fig. No. 1282

Size.....Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$
Rough.....	1.65	2.50	3.50	5.00	7.00
Rough Tinned.....	2.15	3.10	4.40	6.00	8.25
Polished.....	2.85	4.00	5.50	7.50	10.00
Center to Center.....Inches	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	$2\frac{3}{16}$	$2\frac{1}{2}$
Size.....Inches	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4
Rough.....	10.00	16.00	22.00	30.00	40.00
Rough Tinned.....	11.75	18.75	26.00	36.00	47.00
Polished.....	13.50	21.00	29.00	45.00	58.00
Center to Center.....Inches	3	$3\frac{3}{4}$	$4\frac{1}{4}$	...	...

RETURN BENDS, OPEN PATTERN—Fig. No. 1283

Size.....Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$
Rough.....	1.80	2.75	4.00	5.50	8.00
Rough Tinned.....	2.30	3.35	4.90	6.50	9.25
Polished.....	3.00	4.25	6.00	8.00	11.00
Center to Center.....Inches	2	$2\frac{1}{4}$	$2\frac{1}{2}$	3	$3\frac{1}{2}$
Size.....Inches	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4
Rough.....	11.00	18.00	25.00	35.00	45.00
Rough Tinned.....	12.75	20.75	29.00	41.00	52.00
Polished.....	14.50	23.00	32.00	50.00	63.00
Center to Center.....Inches	$4\frac{1}{2}$	6	$6\frac{1}{2}$	....	....

For Right and Left Return Bends, add 20% to above list prices.

Extra Heavy Bronze Fittings are made from Standard 125 Pound Cast Iron Patterns.

For dimensions, see pages 63 to 91.

Bronze Fittings cast from our Extra Heavy Cast Iron Patterns, made to order at special prices.

Specify finish when ordering.

Order by Figure Number.

GRINNELL CAST IRON FITTINGS

*Special Long Turn Fittings For Water**150 Lbs. Water Pressure*

Teapot or Single Sweep Tee
Fig. No. 316



Double Branch or Twin Elbow
Fig. No. 317

LIST PRICES

TEAPOT OR SINGLE SWEEP TEES Fig. No. 316			DOUBLE BRANCH OR TWIN ELBOWS Fig. No. 317		
Size Inches	Straight Each	Reducing Each	Size Inches	Straight Each	Reducing Each
$\frac{3}{4}$	\$0.48	\$0.72	...	.....	.....
1	.48	.72	1	\$0.64	\$0.96
$1\frac{1}{4}$	.60	.90	$1\frac{1}{4}$	.80	1.20
$1\frac{1}{2}$	.82	1.23	$1\frac{1}{2}$	1.10	1.65
2	1.20	1.80	2	1.60	2.40
$2\frac{1}{2}$	1.80	2.70	$2\frac{1}{2}$	2.40	3.60
3	3.40	5.10	3	4.50	6.75
$3\frac{1}{2}$	4.90	7.35	$3\frac{1}{2}$	6.50	9.75
4	5.25	7.88	4	7.00	10.50
5	9.75	14.63	...	.....	.....
6	13.25	19.88	...	.....	.....

For galvanized, double above lists.

For sizes larger than listed above, use Standard Flanged Fittings.

Order by Figure Number.

LIST OF SIZES

Special Long Turn Fittings For Water

Sizes differing from Standard, if furnished, will be charged at special net prices.

Sizes marked † are bushed in the sand from nearest size pattern.

TEAPOT OR SINGLE SWEEP TEES—STRAIGHT SIZES

$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	5	6
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TEAPOT OR SINGLE SWEEP TEES—REDUCING SIZES

1 x1 x $\frac{3}{4}$	2 x2 x $1\frac{1}{4}$	3 x $2\frac{1}{2}$ x2
†1 x $\frac{3}{4}$ x1	2 x2 x1	$3\frac{1}{2}$ x $3\frac{1}{2}$ x2
†1 x $\frac{3}{4}$ x $\frac{3}{4}$	†2 x $1\frac{1}{2}$ x $1\frac{1}{2}$	$3\frac{1}{2}$ x $3\frac{1}{2}$ x $1\frac{1}{2}$
$1\frac{1}{4}$ x $1\frac{1}{4}$ x1	2 x $1\frac{1}{2}$ x1	$3\frac{1}{2}$ x $3\frac{1}{2}$ x $1\frac{1}{4}$
$1\frac{1}{4}$ x $1\frac{1}{4}$ x $\frac{3}{4}$	$2\frac{1}{2}$ x $2\frac{1}{2}$ x2	† $3\frac{1}{2}$ x3 x2
$1\frac{1}{4}$ x1 x1	$2\frac{1}{2}$ x $2\frac{1}{2}$ x $1\frac{1}{2}$	4 x4 x3
† $1\frac{1}{4}$ x1 x $\frac{3}{4}$	$2\frac{1}{2}$ x $2\frac{1}{2}$ x $1\frac{1}{4}$	4 x4 x $2\frac{1}{2}$
$1\frac{1}{4}$ x $\frac{3}{4}$ x $1\frac{1}{4}$	† $2\frac{1}{2}$ x2 x2	4 x4 x2
$1\frac{1}{2}$ x $1\frac{1}{2}$ x $1\frac{1}{4}$	† $2\frac{1}{2}$ x2 x $1\frac{1}{2}$	†4 x4 x $1\frac{1}{2}$
$1\frac{1}{2}$ x $1\frac{1}{2}$ x1	† $2\frac{1}{2}$ x2 x1	4 x4 x $1\frac{1}{4}$
† $1\frac{1}{2}$ x $1\frac{1}{2}$ x $\frac{3}{4}$	3 x3 x $2\frac{1}{2}$	†4 x3 x3
$1\frac{1}{2}$ x $1\frac{1}{4}$ x $1\frac{1}{4}$	3 x3 x2	5 x5 x3
† $1\frac{1}{2}$ x $1\frac{1}{4}$ x1	3 x3 x $1\frac{1}{2}$	†5 x5 x2
† $1\frac{1}{2}$ x $1\frac{1}{4}$ x $\frac{3}{4}$	3 x3 x $1\frac{1}{4}$	†6 x6 x2
2 x2 x $1\frac{1}{2}$	†3 x3 x1	.....

DOUBLE BRANCH OR TWIN ELBOWS

1 x1 x1	$1\frac{1}{2}$ x $1\frac{1}{2}$ x2	$3\frac{1}{2}$ x $3\frac{1}{2}$ x $3\frac{1}{2}$
$1\frac{1}{4}$ x $1\frac{1}{4}$ x $1\frac{1}{4}$	$2\frac{1}{2}$ x $2\frac{1}{2}$ x $2\frac{1}{2}$	4 x4 x4
1 x1 x $1\frac{1}{4}$	2 x2 x $2\frac{1}{2}$	3 x3 x4
$1\frac{1}{2}$ x $1\frac{1}{2}$ x $1\frac{1}{2}$	3 x3 x3	† $2\frac{1}{2}$ x $2\frac{1}{2}$ x4
$1\frac{1}{4}$ x $1\frac{1}{4}$ x $1\frac{1}{2}$	$2\frac{1}{2}$ x $2\frac{1}{2}$ x3	.....
2 x2 x2	†2 x2 x3	.....

DIMENSIONS Teapot or Single Sweep Tees

150 Lbs. Water Pressure

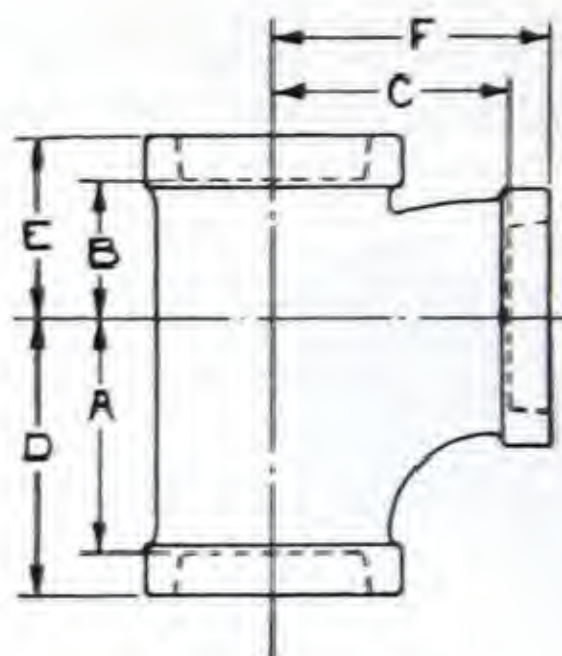


Fig. No. 316

Dimensions A, B and C = End of Pipe
Dimensions D, E and F = Face of Fitting

SIZE			DIMENSIONS					
			A	B	C	D	E	F
$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$	$1\frac{3}{4}$	$\frac{13}{16}$	$1\frac{3}{4}$	$2\frac{1}{4}$	$1\frac{5}{16}$	$2\frac{1}{4}$
1	1	1	$2\frac{3}{16}$	1	$2\frac{3}{16}$	$2\frac{3}{4}$	$1\frac{9}{16}$	$2\frac{3}{4}$
1	1	$\frac{3}{4}$	$1\frac{11}{16}$	$\frac{7}{8}$	$1\frac{13}{16}$	$2\frac{1}{4}$	$1\frac{7}{16}$	$2\frac{5}{16}$
1	$\frac{3}{4}$	1	$2\frac{3}{16}$	$1\frac{1}{16}$	$2\frac{3}{16}$	$2\frac{3}{4}$	$1\frac{9}{16}$	$2\frac{3}{4}$
1	$\frac{3}{4}$	$\frac{3}{4}$	$1\frac{11}{16}$	$\frac{15}{16}$	$1\frac{13}{16}$	$2\frac{1}{4}$	$1\frac{7}{16}$	$2\frac{5}{16}$
$1\frac{1}{4}$	$1\frac{1}{4}$	$1\frac{1}{4}$	$2\frac{5}{8}$	$1\frac{1}{4}$	$2\frac{5}{8}$	$3\frac{1}{4}$	$1\frac{7}{8}$	$3\frac{1}{4}$
$1\frac{1}{4}$	$1\frac{1}{4}$	1	$2\frac{3}{16}$	$1\frac{1}{16}$	$2\frac{3}{8}$	$2\frac{13}{16}$	$1\frac{11}{16}$	$2\frac{15}{16}$
$1\frac{1}{4}$	$1\frac{1}{4}$	$\frac{3}{4}$	$1\frac{11}{16}$	$\frac{7}{8}$	2	$2\frac{5}{16}$	$1\frac{1}{2}$	$2\frac{1}{2}$
$1\frac{1}{4}$	1	1	$2\frac{3}{16}$	$1\frac{1}{16}$	$2\frac{3}{8}$	$2\frac{13}{16}$	$1\frac{5}{8}$	$2\frac{15}{16}$
$1\frac{1}{4}$	1	$\frac{3}{4}$	$1\frac{11}{16}$	$\frac{15}{16}$	2	$2\frac{5}{16}$	$1\frac{1}{2}$	$2\frac{1}{2}$
$1\frac{1}{4}$	$\frac{3}{4}$	$1\frac{1}{4}$	$2\frac{5}{8}$	$1\frac{1}{4}$	$2\frac{5}{8}$	$3\frac{1}{4}$	$1\frac{3}{4}$	$3\frac{1}{4}$
$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$3\frac{3}{16}$	$1\frac{1}{2}$	$3\frac{3}{16}$	$3\frac{13}{16}$	$2\frac{1}{8}$	$3\frac{13}{16}$
$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{4}$	$2\frac{3}{4}$	$1\frac{5}{16}$	$2\frac{3}{4}$	$3\frac{3}{8}$	$1\frac{15}{16}$	$3\frac{3}{8}$
$1\frac{1}{2}$	$1\frac{1}{2}$	1	$2\frac{3}{8}$	$1\frac{3}{16}$	$2\frac{1}{2}$	3	$1\frac{13}{16}$	$3\frac{1}{16}$
$1\frac{1}{2}$	$1\frac{1}{2}$	$\frac{3}{4}$	$2\frac{3}{8}$	$1\frac{3}{16}$	$2\frac{9}{16}$	3	$1\frac{13}{16}$	$3\frac{1}{16}$
$1\frac{1}{2}$	$1\frac{1}{4}$	$1\frac{1}{4}$	$2\frac{3}{4}$	$1\frac{1}{4}$	$2\frac{3}{4}$	$3\frac{3}{8}$	$1\frac{7}{8}$	$3\frac{3}{8}$
$1\frac{1}{2}$	$1\frac{1}{4}$	1	$2\frac{3}{8}$	$1\frac{3}{16}$	$2\frac{1}{2}$	3	$1\frac{13}{16}$	$3\frac{1}{16}$
$1\frac{1}{2}$	$1\frac{1}{4}$	$\frac{3}{4}$	$2\frac{3}{4}$	$1\frac{1}{4}$	$2\frac{7}{8}$	$3\frac{3}{8}$	$1\frac{7}{8}$	$3\frac{3}{8}$
2	2	2	$3\frac{5}{16}$	$1\frac{7}{8}$	$3\frac{5}{16}$	4	$2\frac{9}{16}$	4
2	2	$1\frac{1}{2}$	$3\frac{1}{4}$	$1\frac{9}{16}$	$3\frac{7}{16}$	$3\frac{15}{16}$	$2\frac{1}{4}$	$4\frac{1}{16}$
2	2	$1\frac{1}{4}$	$2\frac{13}{16}$	$1\frac{7}{16}$	3	$3\frac{1}{2}$	$2\frac{1}{8}$	$3\frac{5}{8}$
2	2	1	$2\frac{3}{8}$	$1\frac{1}{4}$	$2\frac{13}{16}$	$3\frac{1}{16}$	$1\frac{15}{16}$	$3\frac{3}{8}$
2	$1\frac{1}{2}$	$1\frac{1}{2}$	$3\frac{1}{4}$	$1\frac{5}{8}$	$3\frac{7}{16}$	$3\frac{15}{16}$	$2\frac{1}{4}$	$4\frac{1}{16}$

DIMENSIONS

Teapot or Single Sweep Tees (Continued)

150 Lbs. Water Pressure

SIZE			DIMENSIONS					
			A	B	C	D	E	F
2	1½	1	2⅜	1⅝	2⅓	3⅛	1⅝	3⅜
2½	2½	2½	3⅝	2⅛	3⅝	4½	2⅝	4½
2½	2½	2	3⅜	1¾	3½	4⅛	2⅝	4⅜
2½	2½	1½	3⅜	1½	3⅜	4⅛	2⅝	4⅝
2½	2½	1¼	2⅜	1⅝	3⅝	3⅞	2⅝	3⅝
2½	2	2	3⅜	1⅝	3½	4⅛	2⅝	4⅜
2½	2	1½	3⅜	1⅝	3⅜	4⅛	2⅝	4⅝
2½	2	1	2⅜	1½	3⅜	3⅞	2⅝	3⅝
3	3	3	4⅛	2½	4⅛	5	3⅞	5
3	3	2½	3⅝	2⅛	3⅝	4⅞	3⅞	4⅜
3	3	2	3⅜	1⅝	3⅜	4⅞	2⅝	4½
3	3	1½	3⅜	1½	4⅛	4⅞	2⅝	4⅝
3	3	1¼	2¾	1⅝	3⅝	3⅞	2⅝	4¼
3	3	1	2¾	1⅝	3⅜	3⅞	2⅝	4¼
3	2½	2	3⅜	1⅝	3⅜	4⅞	2⅝	4½
3½	3½	3½	4¾	2⅝	4¾	5¾	3⅞	5¾
3½	3½	2	3¼	1⅝	4⅞	4¼	2⅝	4⅜
3½	3½	1½	3⅜	1⅝	4⅝	4⅞	2⅝	4⅝
3½	3½	1¼	2¾	1⅝	3⅝	3¾	2⅝	4⅞
3½	3	2	3¼	1⅝	4⅞	4¼	2⅝	4⅜
4	4	4	5⅞	3⅞	5⅞	6½	4⅞	6½
4	4	3	4⅞	2⅝	4½	5⅞	3⅞	5½
4	4	2½	3¾	2¼	4½	4⅞	3⅞	5⅜
4	4	2	3⅝	1⅝	4⅝	4⅞	2⅝	5⅞
4	4	1½	3⅝	1⅝	4⅞	4⅞	2⅝	5⅞
4	4	1¼	2⅝	1⅝	4⅞	3⅞	2⅝	4⅜
4	3	3	4⅞	2¾	4½	5⅞	3⅞	5½
5	5	5	6⅝	3⅞	6⅝	7½	5	7½
5	5	3	4⅞	2⅝	5⅞	5¼	3⅞	6⅞
5	5	2	4⅞	2⅝	5⅞	5¼	3⅞	6⅞
6	6	6	7¾	4⅞	7¾	9	5⅞	9
6	6	3	4⅞	2⅝	5⅞	5⅞	3⅞	6⅞
6	6	2	4⅞	2⅝	6	5⅞	3⅞	6⅞

DIMENSIONS

Double Branch or Twin Elbows

150 Lbs. Water Pressure

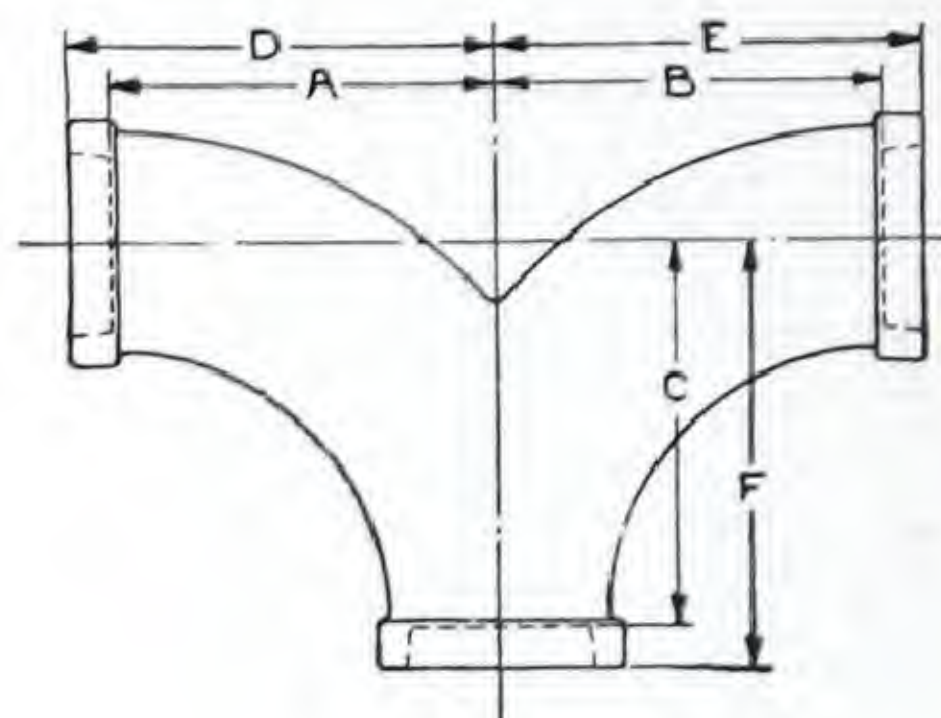


Fig. No. 317

Dimensions A, B and C = End of Pipe
 Dimensions D, E and F = Face of Fitting

SIZE			DIMENSIONS					
			A	B	C	D	E	F
1	1	1	2 $\frac{1}{4}$	2 $\frac{1}{4}$	2 $\frac{1}{4}$	2 $\frac{13}{16}$	2 $\frac{13}{16}$	2 $\frac{13}{16}$
1 $\frac{1}{4}$	1 $\frac{1}{4}$	1 $\frac{1}{4}$	2 $\frac{5}{8}$	2 $\frac{5}{8}$	2 $\frac{5}{8}$	3 $\frac{1}{4}$	3 $\frac{1}{4}$	3 $\frac{1}{4}$
1	1	1 $\frac{1}{4}$	2 $\frac{1}{2}$	2 $\frac{1}{2}$	2 $\frac{1}{2}$	3 $\frac{1}{8}$	3 $\frac{1}{8}$	3 $\frac{1}{8}$
1 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	3 $\frac{1}{4}$	3 $\frac{1}{4}$	3 $\frac{1}{4}$	3 $\frac{7}{8}$	3 $\frac{7}{8}$	3 $\frac{7}{8}$
1 $\frac{3}{4}$	1 $\frac{3}{4}$	1 $\frac{1}{2}$	3	3	3 $\frac{1}{8}$	3 $\frac{5}{8}$	3 $\frac{5}{8}$	3 $\frac{11}{16}$
2	2	2	4 $\frac{3}{16}$	4 $\frac{3}{16}$	4 $\frac{3}{16}$	4 $\frac{7}{8}$	4 $\frac{7}{8}$	4 $\frac{7}{8}$
1 $\frac{1}{2}$	1 $\frac{1}{2}$	2	3 $\frac{3}{4}$	3 $\frac{3}{4}$	3 $\frac{3}{4}$	4 $\frac{3}{8}$	4 $\frac{3}{8}$	4 $\frac{7}{16}$
2 $\frac{1}{2}$	2 $\frac{1}{2}$	2 $\frac{1}{2}$	5 $\frac{1}{8}$	5 $\frac{1}{8}$	5 $\frac{1}{8}$	6	6	6
2	2	2 $\frac{1}{2}$	4 $\frac{11}{16}$	4 $\frac{11}{16}$	4 $\frac{5}{8}$	5 $\frac{3}{8}$	5 $\frac{3}{8}$	5 $\frac{1}{2}$
3	3	3	6 $\frac{3}{16}$	6 $\frac{3}{16}$	6 $\frac{3}{16}$	7 $\frac{1}{16}$	7 $\frac{1}{16}$	7 $\frac{1}{16}$
2 $\frac{1}{2}$	2 $\frac{1}{2}$	3	5 $\frac{9}{16}$	5 $\frac{9}{16}$	5 $\frac{11}{16}$	6 $\frac{7}{16}$	6 $\frac{7}{16}$	6 $\frac{9}{16}$
2	2	3	5 $\frac{3}{4}$	5 $\frac{3}{4}$	5 $\frac{5}{8}$	6 $\frac{7}{16}$	6 $\frac{7}{16}$	6 $\frac{9}{16}$
3 $\frac{1}{2}$	3 $\frac{1}{2}$	3 $\frac{1}{2}$	7 $\frac{3}{16}$	7 $\frac{3}{16}$	7 $\frac{3}{16}$	8 $\frac{1}{8}$	8 $\frac{1}{8}$	8 $\frac{1}{8}$
4	4	4	8 $\frac{3}{16}$	8 $\frac{3}{16}$	8 $\frac{3}{16}$	9 $\frac{3}{16}$	9 $\frac{3}{16}$	9 $\frac{3}{16}$
3	3	4	5 $\frac{5}{8}$	5 $\frac{5}{8}$	5 $\frac{1}{2}$	6 $\frac{1}{2}$	6 $\frac{1}{2}$	6 $\frac{1}{2}$
2 $\frac{1}{2}$	2 $\frac{1}{2}$	4	5 $\frac{5}{8}$	5 $\frac{5}{8}$	5 $\frac{7}{16}$	6 $\frac{1}{2}$	6 $\frac{1}{2}$	6 $\frac{1}{2}$

GRINNELL CAST IRON FITTINGS

Long Turn Fittings

Standard—For Water Working Pressures up to 150 Lbs.

Extra Heavy—For Water Working Pressures up to 250 Lbs.

On the following pages we illustrate the Grinnell Line of Standard and Extra Heavy Long Turn Fittings and Drip or Drain Tees. Grinnell Long Turn Fittings, 2½ to 6-inch inclusive, are designed in accordance with the rules and requirements of the National Fire Protection Association and are known as "American Standard Long Turn Fittings."

These fittings are recommended for a water working pressure of 150 pounds and 250 pounds.

The rules and regulations of the National Board of Fire Underwriters and the rules of the Inspection Department of the Associated Factory Mutual Fire Insurance Companies were the governing factors in determining our list of stock sizes. These rules provide that reducing fittings having a reduction of 1-inch or more on the outlets which change the direction of flow, need not be long turn.

All screwed fittings are threaded accurately to gauge.

The Flanges of all Standard Long Turn Fittings are furnished faced and drilled to American Standard Template.

The Flanges of all Extra Heavy Long Turn Fittings are furnished with 1/16-inch raised face and are drilled to American Extra Heavy Template.

Grinnell Standard and Extra Heavy Flanged Fittings, sizes 7-inch and larger, are approved for use in sprinkler systems.

Screwed, flanged and combination screwed and flanged fittings all have the same center to end dimensions for each respective size. When one end of a reducing fitting is ordered flanged, the large opening will be flanged unless otherwise specified. Long turn fittings not bossed may be tapped on the side for drain or test purposes as follows:

2½, 3 and 3½-inch fittings, ⅜-inch pipe tap.

4-inch fittings, ½-inch pipe tap.

5 and 6-inch fittings, ¾-inch pipe tap.

See following pages for list prices and dimensions.

GRINNELL CAST IRON FITTINGS

Long Turn Elbows

150 Lbs. Water Pressure



Fig. No. 301 Fig. No. 302 Fig. No. 303 Bossed*

SIZE INCHES	LIST PRICES			
	Screw Fig. No. 301		FACED AND DRILLED	
			Flange, One End Fig. No. 302	Flanges, Both Ends Fig. No. 303
	Straight	Reducing		
3/4	\$0.32	\$0.48	.....	.....
1	.32	.48	.....	.....
1 1/4	.40	.60	.....	.....
1 1/2	.55	.83	.....	.....
2	.80	1.20	.....	.....
2 1/2	1.20	1.80	\$5.50	\$6.75
3	2.25	3.38	6.00	7.50
3 1/2	3.25	4.88	6.50	8.50
4	3.50	5.25	7.50	10.00
4 1/2	5.50	8.25	.....	.....
5	6.50	9.75	10.00	12.50
6	8.75	13.13	14.00	17.50

Reducing Long Turn Elbows are made to order by bushing in the sand.
For galvanized, double above lists.

See pages 196 and 197 for Dimensions and List of Stock Sizes.

*Long Turn Bossed Elbows

For Fig. Nos. on Bossed Elbows see Dimension Table on Page 197.

For List Prices of Bossed Elbows, add as follows to List Prices given above:

- Solid Bosses (cored for 1/2" tap).....\$1.00
- Screw or Slip Bosses.....1.50

Order by Figure Number.

GRINNELL CAST IRON FITTINGS

Long Turn Tees

150 Lbs. Water Pressure



Fig. No. 304



Fig. No. 305



Fig. No. 306



Fig. No. 307



Fig. No. 309

LIST PRICES

SIZE, INCHES	LIST PRICES			
	Screw Fig. No. 304	Reducing Screw Fig. No. 304	FACED AND DRILLED	
			Flanges One or Two Ends, Fig. Nos. 305 306, 307	Flanges Three Ends Fig. No. 309
1½	\$ 1.10	.....	.....	.....
2	1.60	.....	.....	.....
2½	2.40	\$ 3.60	\$ 9.00	\$10.00
3	4.50	6.75	10.00	11.50
3½	6.50	9.75	11.00	13.00
4	7.00	10.50	12.00	15.00
5	13.00	19.50	15.00	18.00
6	17.50	26.25	22.00	26.00

For List Prices of S. S. F. Tees with 2" Screw Boss opposite Flange, (Figure No. 307-A,) add \$1.50 to List Prices given above for No. 307.

For galvanized, double above lists.

See pages 198 and 199 for Dimensions and List of Stock Sizes.

Order by Figure Number.

GRINNELL CAST IRON FITTINGS

*Long Turn Crosses**150 Lbs. Water Pressure*

Fig. No. 310

Size, INCHES	LIST PRICES	
	FLANGE FACED AND DRILLED	
	Flanged One End—Fig. No. 310	
2½		\$12.50
3		13.50
3½		15.00
4		17.00
5		22.00
6		30.00

For galvanized, double above lists.

See page 200 for Dimensions and List of Stock Sizes.

Order by Figure Number.

GRINNELL CAST IRON FITTINGS

*Drip or Drain Tees**150 Lbs. Water Pressure*

Fig. No. 321



Fig. No. 322

LIST PRICES
FLANGES FACED AND DRILLED

SIZE,
INCHES

Flanged One End
Fig. No. 321

Flanged Two Ends
Fig. No. 322

2½

\$ 2.83

\$ 4.83

3

3.50

5.75

3½

4.25

6.75

4

5.00

8.00

5

7.15

10.80

6

8.60

12.60

8

17.75

24.25

For galvanized, double above lists.

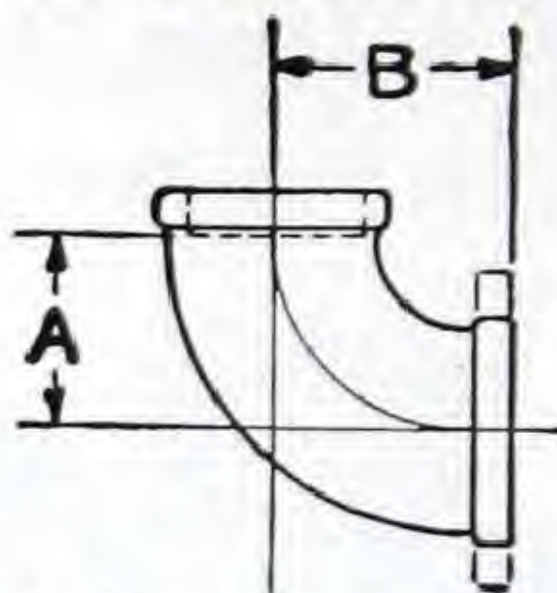
See page 201 for Dimensions and List of Stock Sizes.

Order by Figure Number.

DIMENSIONS AND STOCK SIZES

Long Turn Elbows

150 Lbs. Water Pressure



Dimension A indicates end of pipe.

Dimension B is same for Flange and Screw.

X = Elbows in Stock. * = Galv.

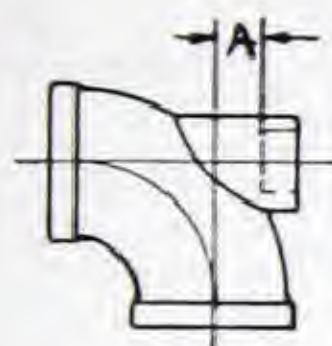
SIZE	DIMENSIONS		STOCK SIZES		
	A	B	Screw No. 301	F. S. No. 302	F. F. No. 303
$\frac{3}{4}$	$2\frac{1}{4}$	$2\frac{3}{4}$	X	..	..
1	$2\frac{3}{16}$	$2\frac{3}{4}$	X *	..	..
$1\frac{1}{4}$	$2\frac{5}{8}$	$3\frac{1}{4}$	X *	..	..
$1\frac{1}{2}$	$3\frac{3}{16}$	$3\frac{13}{16}$	X *	..	..
2	$3\frac{5}{16}$	4	X *	..	..
$2\frac{1}{2}$	$3\frac{5}{8}$	$4\frac{1}{2}$	X *	X	X
3	$4\frac{1}{16}$	5	X *	X	X
$3\frac{1}{2}$	$4\frac{3}{4}$	$5\frac{3}{4}$	X *	X	X
4	$5\frac{7}{16}$	$6\frac{1}{2}$	X *	X	X
$4\frac{1}{2}$	$6\frac{3}{8}$	$7\frac{1}{2}$	X	..	..
5	$6\frac{5}{16}$	$7\frac{1}{2}$	X *	X	X
6	$7\frac{3}{4}$	9	X *	X	X

Order by Figure Number.

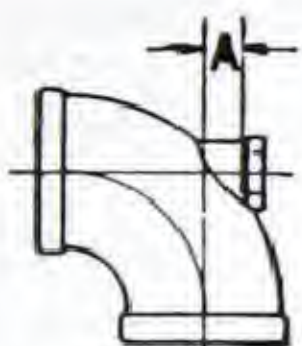
DIMENSIONS AND STOCK SIZES

Long Turn Bossed Elbows

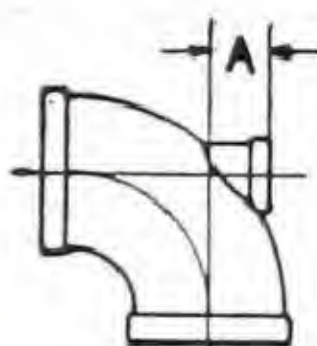
150 Lbs. Water Pressure



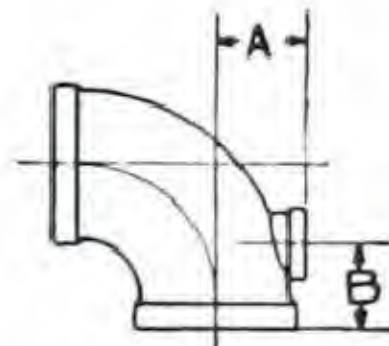
Slip Boss



Screw Boss



Solid Boss



Boss Near Band

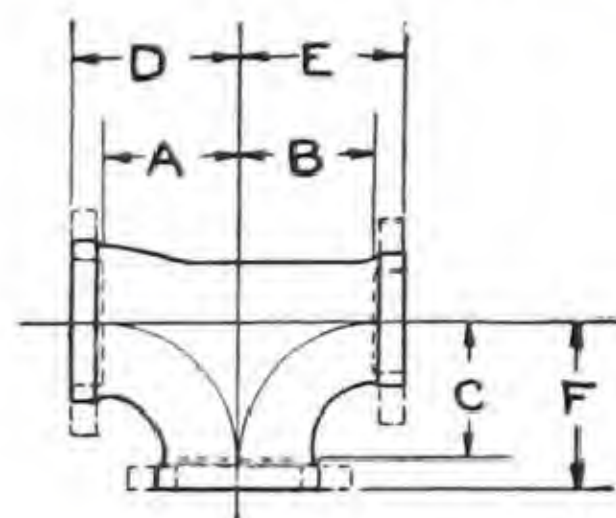
X = Stock. P = Pattern only.

Solid Bosses, cored for $\frac{1}{2}$ ", can be tapped size noted and under.

Size Elbow	Size Boss		SCREW ELBOWS				FLG. & SCR. ELBOWS					F. F.
			Boss			Solid Boss Near Band 301-D	Boss Opp. Screw End			Boss Opp. Flg. End		
			Slip 301-A	Ser. 301-B	Solid 301-C		Slip 302-A	Ser. 302-B	Solid 302-C	Slip 302-D	Solid 302-E		Solid 303-A
2½	1½	A	...	...	1¾	2⅜	...	...	1¾	...	1¾	...
		B	...	...	...	2⅜	...	...	...	...	...
		Stk.	...	...	X	X	...	...	X	...	...
3	1½	A	...	...	1⅜	2¾	...	...	1⅜	...	1⅜	...
		B	...	...	...	3¼	...	...	...	...	...
		Stk.	...	...	X	X	...	...	X	...	...
	2	A	...	...	...	...	...	...	...	1½	...	...
		B	...	...	...	...	...	...	...	P	...	...
		Stk.	...	...	...	...	...	...	...	...	...	...
3½	1½	A	...	...	2⅛	3⅛	...	...	2⅛	...	2⅛	...
		B	...	...	...	3¾	...	...	...	...	...	...
		Stk.	...	...	X	X	...	...	X	...	X	...
	2	A	...	...	...	...	...	...	...	...	...	2¼
		B	...	...	...	...	...	...	...	...	...	X
		Stk.	...	...	...	...	...	...	...	...	...	...
4	2	A	...	1⅜	2¼	3⅜	1⅝	1⅜	2¼	1⅝	2¼	2¼
		B	...	...	...	3⅞	...	...	...	...	...	...
		Stk.	...	X	X	X	P	X	X	X	X	X
5	2	A	...	1⅜	2⅝	4⅜	...	1⅜	2⅝	...	2⅝	2⅝
		B	...	...	...	4	...	...	...	...	...	...
		Stk.	...	X	X	X	...	X	X	...	X	X
	2½	A	2⅜	...	...	...	2⅜	...	...	2⅜	...	...
		B	X	...	...	...	...	...	...	...	...	...
		Stk.	...	...	...	...	...	...	...	...	...	...
6	2	A	...	2	2⅜	4½	...	2	2⅜	...	2⅜	2⅜
		B	...	...	...	3⅞	...	...	...	...	...	...
		Stk.	...	X	X	X	...	X	X	...	X	X
	2½	A	2⅛	...	...	...	2⅛	...	...	2⅛	...	...
		B	X	...	...	...	...	...	...	...	...	...
		Stk.	...	...	...	...	...	...	...	...	...	...

Order by Figure Number.

DIMENSIONS AND STOCK SIZES



Long Turn Tees

150 Lbs. Water Pressure

Dimensions A-B-C indicate End of Pipe.
D-E-F are same for Flange and Screw.
X = Tees in Stock.

SIZE			DIMENSIONS						STOCK SIZES				
			A	B	C	D	E	F	Ser. 304	F.S.S. 305	F.S.F. 306	S.S.F. 307	F.F.F. 309
1½	1½	1½	3 3/16	3 3/16	3 3/16	3 13/16	3 13/16	3 13/16	X	...	...	...	...
2	2	2	3 5/16	3 5/16	3 5/16	4	4	4	X	...	...	...	...
2½	2½	2½	3 5/8	3 5/8	3 5/8	4 1/2	4 1/2	4 1/2	X	X	X	...	...
2½	2	2½	3 5/8	3 1/2	3 5/8	4 1/2	4 3/16	4 1/2	X	X	...	...	...
3	3	3	4 1/16	4 1/16	4 1/16	5	5	5	X	X	X	...	X
3	3	2½	3 5/8	3 5/8	3 15/16	4 9/16	4 9/16	4 13/16	X	X	...	...	...
3	2½	3	4 1/16	3 15/16	4 1/16	5	4 13/16	5	X	X	...	...	...
3	2½	2½	3 15/16	3 5/8	3 15/16	4 9/16	4 1/2	4 13/16	X	X	...	...	...
3	2	3	4 1/16	3 13/16	4 1/16	5	4 1/2	5	X	...	...	...	...
2½	2½	3	3 15/16	3 15/16	3 5/8	4 13/16	4 13/16	4 9/16	X	...	...	X	...
2½	2	3	3 15/16	3 13/16	3 5/8	4 13/16	4 1/2	4 9/16	X	...	...	...	...
3½	3½	3½	4 3/4	4 3/4	4 3/4	5 3/4	5 3/4	5 3/4	X	X	X	...	X
3½	3½	3	4	4	4 5/16	5	5	5 1/4	X	X	...	...	...
3½	3½	2½	3 11/16	3 11/16	4 1/4	4 11/16	4 11/16	5 1/8	X	X	...	...	...
3½	3	3½	4 3/4	4 5/16	4 3/4	5 3/4	5 1/4	5 3/4	X	X	...	...	...
3½	3	3	4	4 1/16	4 5/16	5	5	5 1/4	X	X	...	...	...
3½	3	2½	3 11/16	3 5/8	4 1/4	4 11/16	4 9/16	5 1/8	X	...	...	...	...
3½	2½	3½	4 3/4	4 1/4	4 3/4	5 3/4	5 1/8	5 3/4	X	...	...	...	...
3½	2½	3	4	3 15/16	4 5/16	5	4 13/16	5 1/4	X	...	...	...	...
3½	2½	2½	4	3 15/16	4 3/8	5	4 13/16	5 1/4	X	...	...	...	...
3½	2	3½	4 3/4	4 1/8	4 3/4	5 3/4	4 13/16	5 3/4	X	...	...	...	...
3½	2	3	4	4 1/8	4 5/16	5	4 13/16	5 1/4	X	...	...	...	...
3	3	3½	4 5/16	4 5/16	4	5 1/4	5 1/4	5	X	...	...	X	...
3	2½	3½	4 5/16	4 1/4	4	5 1/4	5 1/8	5	X	...	...	...	...
3	2	3½	4 5/16	4 1/8	4	5 1/4	4 13/16	5	X	...	...	...	...
2½	2½	3½	4 1/4	4 1/4	3 11/16	5 1/8	5 1/8	4 11/16	X	...	...	...	...

Order by Figure Number.

DIMENSIONS AND STOCK SIZES

Long Turn Tees

(Continued)

See Sketch and Notes on opposite page.

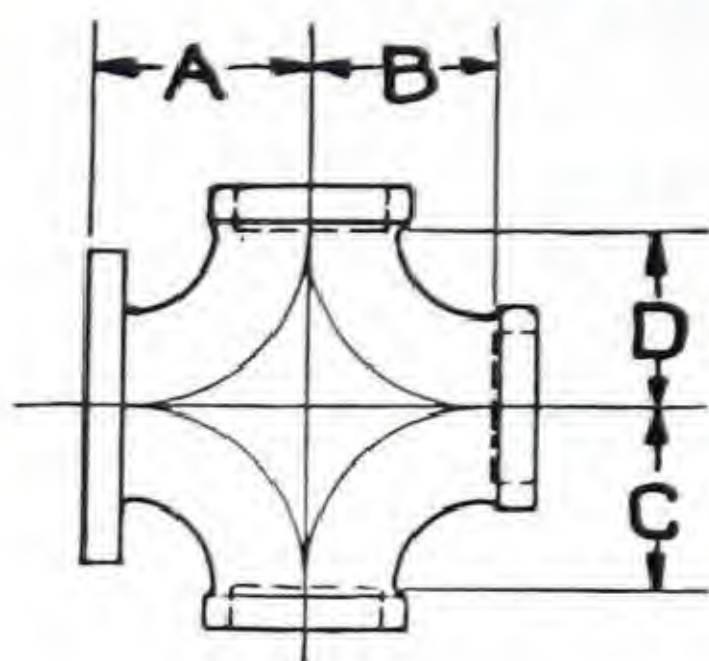
SIZE			DIMENSIONS						STOCK SIZES				
			A	B	C	D	E	F	Scr. 304	F.S.S. 305	F.S.F. 306	S.S.F. 307	F.F.F. 309
4	4	4	$5\frac{7}{16}$	$5\frac{7}{16}$	$5\frac{7}{16}$	$6\frac{1}{2}$	$6\frac{1}{2}$	$6\frac{1}{2}$	X	X	X	...	X
4	4	$3\frac{1}{2}$	$4\frac{3}{4}$	$4\frac{3}{4}$	5	$5\frac{13}{16}$	$5\frac{13}{16}$	6	X	X	X	...	...
4	4	3	$4\frac{1}{8}$	$4\frac{1}{8}$	$4\frac{9}{16}$	$5\frac{3}{16}$	$5\frac{3}{16}$	$5\frac{1}{2}$	...	X	...	...	...
4	$3\frac{1}{2}$	4	$5\frac{7}{16}$	5	$5\frac{7}{16}$	$6\frac{1}{2}$	6	$6\frac{1}{2}$	X	X	X	...	...
4	$3\frac{1}{2}$	$3\frac{1}{2}$	$4\frac{3}{4}$	$4\frac{3}{4}$	5	$5\frac{13}{16}$	$5\frac{3}{4}$	6	X	X	...	...	...
4	3	4	$5\frac{7}{16}$	$4\frac{9}{16}$	$5\frac{7}{16}$	$6\frac{1}{2}$	$5\frac{1}{2}$	$6\frac{1}{2}$	X	...	...	...	...
4	3	$3\frac{1}{2}$	$4\frac{3}{4}$	$4\frac{5}{16}$	5	$5\frac{13}{16}$	$5\frac{1}{4}$	6	X	...	...	...	...
4	$2\frac{1}{2}$	4	$5\frac{7}{16}$	$4\frac{1}{2}$	$5\frac{7}{16}$	$6\frac{1}{2}$	$5\frac{3}{8}$	$6\frac{1}{2}$	X	...	...	...	...
4	$2\frac{1}{2}$	$3\frac{1}{2}$	$5\frac{7}{16}$	$4\frac{1}{2}$	$5\frac{1}{2}$	$6\frac{1}{2}$	$5\frac{3}{8}$	$6\frac{1}{2}$	X	...	...	...	...
$3\frac{1}{2}$	$3\frac{1}{2}$	4	5	5	$4\frac{3}{4}$	6	6	$5\frac{13}{16}$	X	...	...	X	...
$3\frac{1}{2}$	3	4	5	$4\frac{9}{16}$	$4\frac{3}{4}$	6	$5\frac{1}{2}$	$5\frac{13}{16}$	X	...	...	...	...
$3\frac{1}{2}$	$2\frac{1}{2}$	4	5	$4\frac{1}{2}$	$4\frac{3}{4}$	6	$5\frac{3}{8}$	$5\frac{13}{16}$	X	...	...	...	...
5	5	5	$6\frac{5}{16}$	$6\frac{5}{16}$	$6\frac{5}{16}$	$7\frac{1}{2}$	$7\frac{1}{2}$	$7\frac{1}{2}$	X	X	X	...	X
5	5	4	$5\frac{7}{16}$	$5\frac{7}{16}$	$6\frac{1}{16}$	$6\frac{5}{8}$	$6\frac{5}{8}$	$7\frac{1}{8}$	...	X	X	...	...
5	4	5	$6\frac{5}{16}$	$6\frac{1}{16}$	$6\frac{5}{16}$	$7\frac{1}{2}$	$7\frac{1}{8}$	$7\frac{1}{2}$	X	X	X	X	...
5	$3\frac{1}{2}$	5	$6\frac{5}{16}$	$5\frac{9}{16}$	$6\frac{5}{16}$	$7\frac{1}{2}$	$6\frac{9}{16}$	$7\frac{1}{2}$	X	...	...	...	...
5	3	5	$6\frac{5}{16}$	$5\frac{1}{8}$	$6\frac{5}{16}$	$7\frac{1}{2}$	$6\frac{1}{16}$	$7\frac{1}{2}$	X	...	...	X	...
5	$2\frac{1}{2}$	5	$6\frac{5}{16}$	$5\frac{1}{8}$	$6\frac{5}{16}$	$7\frac{1}{2}$	6	$7\frac{1}{2}$	X	...	...	...	...
6	6	6	$7\frac{3}{4}$	$7\frac{3}{4}$	$7\frac{3}{4}$	9	9	9	X	X	X	...	X
6	6	5	$6\frac{5}{16}$	$6\frac{5}{16}$	$6\frac{7}{8}$	$7\frac{9}{16}$	$7\frac{9}{16}$	$8\frac{1}{16}$	...	X	X	...	X
6	6	4	$5\frac{7}{16}$	$5\frac{7}{16}$	$6\frac{5}{8}$	$6\frac{11}{16}$	$6\frac{11}{16}$	$7\frac{11}{16}$	...	X	...	...	X
6	5	6	$7\frac{3}{4}$	$6\frac{7}{8}$	$7\frac{3}{4}$	9	$8\frac{1}{16}$	9	X	X	...	X	...
6	5	5	$6\frac{5}{16}$	$6\frac{5}{16}$	$6\frac{7}{8}$	$7\frac{9}{16}$	$7\frac{1}{2}$	$8\frac{1}{16}$	...	X	...	...	...
6	4	6	$7\frac{3}{4}$	$6\frac{5}{8}$	$7\frac{3}{4}$	9	$7\frac{11}{16}$	9	X	X	X	X	...
6	$3\frac{1}{2}$	6	$7\frac{3}{4}$	$6\frac{3}{16}$	$7\frac{3}{4}$	9	$7\frac{3}{16}$	9	X	...	...	...	...
6	3	6	$7\frac{3}{4}$	$5\frac{3}{4}$	$7\frac{3}{4}$	9	$6\frac{11}{16}$	9	X	...	...	...	...
4	4	4							...	...	...	307-A X	...
5	5	5	} 2" Boss on Back in Center						...	...	...	X	...
6	6	6							...	...	...	X	...

Order by Figure Number.

DIMENSIONS AND STOCK SIZES

Long Turn Crosses

150 Lbs. Water Pressure



Dimensions B-C-D indicate End of Pipe.

X = Crosses in Stock

SIZE				DIMENSIONS				STOCK
				A	B	C	D	F.S.S.S. No. 310
3	3	2½	2½	4 ⁹ / ₁₆	3 ⁵ / ₈	3 ¹⁵ / ₁₆	3 ¹⁵ / ₁₆	X
3½	3½	3½	3½	5¾	4¾	4¾	4¾	X
3½	3½	3½	2½	5¾	4¾	4¾	4¼	X
3½	3½	3	3	5	4	4 ⁵ / ₁₆	4 ⁵ / ₁₆	X
3½	3½	3	2½	5	4	4 ⁵ / ₁₆	4¼	X
3½	3½	2½	2½	4 ¹¹ / ₁₆	3 ¹¹ / ₁₆	4¼	4¼	X
3½	2½	2½	2½	4 ¹¹ / ₁₆	3 ¹³ / ₁₆	4¼	4¼	X
4	4	4	4	6½	5 ⁷ / ₁₆	5 ⁷ / ₁₆	5 ⁷ / ₁₆	X
4	4	3½	3½	5 ¹³ / ₁₆	4¾	5	5	X
4	4	3½	3	5 ¹³ / ₁₆	4¾	5	4 ⁹ / ₁₆	X
4	4	3½	2½	5 ¹³ / ₁₆	4¾	5	4½	X
5	5	5	5	7½	6 ⁵ / ₁₆	6 ⁵ / ₁₆	6 ⁵ / ₁₆	X
5	5	5	3	7½	6 ⁵ / ₁₆	6 ⁵ / ₁₆	5½	X
6	6	6	6	9	7¾	7¾	7¾	X

Order by Figure Number.

DIMENSIONS AND STOCK SIZES

Drip or Drain Tees

150 Lbs. Water Pressure



Dimensions A and B indicate End of Pipe.
 C and D are same for Flange and Screw.
 X = Stock. † = 2 Tap Bolts each Flange.

SIZE			DIMENSIONS				STOCK	
			A	B	C	D	F.S.S. No. 321	F.F.S. No. 322
2½	2½	1½	1 ⁵ / ₁₆	1 ¹³ / ₁₆	2 ³ / ₁₆	2 ³ / ₁₆	X	....
2½	2½	1¼	1 ³ / ₁₆	1¾	2 ¹ / ₁₆	2 ¹ / ₁₆	X	....
2½	2½	1	1	1¾	1 ¹⁵ / ₁₆	1 ¹⁵ / ₁₆	X	....
3	3	1½	1 ³ / ₈	2 ⁵ / ₁₆	2 ⁵ / ₁₆	2 ⁵ / ₁₆	X	X
3	3	1¼	1¼	2 ¹ / ₈	2 ³ / ₁₆	2 ³ / ₁₆	X	....
3	3	1	1¼	2 ³ / ₁₆	2 ³ / ₁₆	2 ³ / ₁₆	X	....
3½	3½	2	1 ⁵ / ₈	2½	2 ⁵ / ₈	2 ⁵ / ₈	X	....
3½	3½	1½	1 ³ / ₈	2 ⁷ / ₁₆	2 ³ / ₈	2 ³ / ₈	X	X
3½	3½	1¼	1¼	2 ³ / ₈	2¼	2¼	X	X
4	4	2	1 ⁵ / ₈	2 ¹³ / ₁₆	2 ¹¹ / ₁₆	2 ¹¹ / ₁₆	X†	X†
4	4	1½	1 ³ / ₈	2 ¹¹ / ₁₆	2 ⁷ / ₁₆	2 ⁷ / ₁₆	X	X
4	4	1¼	1¼	2 ¹¹ / ₁₆	2 ⁵ / ₁₆	2 ⁵ / ₁₆	X	X
4	4	1	1¼	2¾	2 ⁵ / ₁₆	2 ⁵ / ₁₆	X	....
4	4	¾	1¼	2 ¹³ / ₁₆	2 ⁵ / ₁₆	2 ⁵ / ₁₆	X	....
5	5	2	1¾	3 ⁷ / ₁₆	2 ¹⁵ / ₁₆	2 ¹⁵ / ₁₆	X	X
5	5	1½	1½	3 ³ / ₈	2 ¹¹ / ₁₆	2 ¹¹ / ₁₆	X	X
5	5	1¼	1 ³ / ₈	3 ⁵ / ₁₆	2 ⁹ / ₁₆	2 ⁹ / ₁₆	X	....
5	5	1	1 ³ / ₈	3 ³ / ₈	2 ⁹ / ₁₆	2 ⁹ / ₁₆	X	....
6	6	2½	2	3 ⁷ / ₈	3¼	3¼	X†	X†
6	6	2	1¾	3 ¹⁵ / ₁₆	3	3	X	X
6	6	1½	1½	3 ⁷ / ₈	2¾	2¾	X	X
6	6	1¼	1 ³ / ₈	3 ¹³ / ₁₆	2 ⁵ / ₈	2 ⁵ / ₈	X	X
6	6	1	1 ³ / ₈	3 ⁷ / ₈	2 ⁵ / ₈	2 ⁵ / ₈	X	X
8	8	3	3 ¹ / ₈	5 ³ / ₁₆	4½	4½	X	X
8	8	2½	2 ⁵ / ₁₆	5 ¹ / ₁₆	3 ¹¹ / ₁₆	3 ¹¹ / ₁₆	X	X
8	8	2	2 ¹ / ₁₆	5 ³ / ₁₆	3 ⁷ / ₁₆	3 ⁷ / ₁₆	X	X

Order by Figure Number.

GRINNELL CAST IRON FITTINGS

Extra Heavy Long Turn Elbows

250 Lbs. Water Pressure



Fig. No. 324



Fig. No. 325



Bossed*

SIZE INCHES	LIST PRICES		
	Screw Fig. No. 324		FACED AND DRILLED
	Straight	Reducing	Flange, One End Fig. No. 325
1½	\$1.10	\$1.65	.....
2	1.60	2.40	.....
2½	2.40	3.60	\$11.00
3	4.50	6.75	12.00
3½	6.50	9.75	13.00
4	7.00	10.50	15.00
5	13.00	19.50	20.00
6	17.50	26.25	28.00

Reducing Extra Heavy Long Turn Elbows, are made to order by bushing in the sand.

For galvanized, add 50 per cent. to above lists.

See page 205 for dimensions.

***Extra Heavy Long Turn Bossed Elbows**

For Fig. Nos. on Extra Heavy Bossed Elbows see Dimension Table on Page 205.

For List Prices of Extra Heavy Bossed Elbows, add as follows to List Prices given above:

Solid Bosses (cored for ½" tap).....\$2.00

Screw or Slip Bosses..... 3.00

Order by Figure Number.

GRINNELL CAST IRON FITTINGS

*Extra Heavy Long Turn Tees**250 Lbs. Water Pressure*

Fig. No. 327



Fig. No. 328



Fig. No. 329



Fig. No. 330



Fig. No. 332

LIST PRICES

SIZE INCHES	LIST PRICES			
	Screw Fig. No. 327	Reducing Screw Fig. No. 327	FACED AND DRILLED	
			Flanges One or Two Ends Fig. Nos. 328, 329, 330	Flanges Three Ends Fig. No. 332
1½	\$ 2.20	.....	.....	.....
2	3.20	.....	.....	.....
2½	4.80	\$ 7.20	\$18.00	\$20.00
3	9.00	13.50	20.00	23.00
3½	13.00	19.50	22.00	26.00
4	14.00	21.00	24.00	30.00
5	26.00	39.00	30.00	36.00
6	35.00	52.50	44.00	52.00

For galvanized, add 50 per cent to above lists.
See page 206 for dimensions.
Order by Figure Number.

GRINNELL CAST IRON FITTINGS

*Extra Heavy Drip or Drain Tees**250 Lbs. Water Pressure*

Fig. No. 318



Fig. No. 319

SIZE INCHES	LIST PRICES FLANGES FACED AND DRILLED	
	Flanged One End Fig. No. 318	Flanged Two Ends Fig. No. 319
2½	\$ 5.65	\$ 9.65
3	7.00	11.50
3½	8.50	13.50
4	10.00	16.00
5	14.30	21.60
6	17.20	25.20
8	35.50	48.50

For galvanized, add 50 per cent to above lists.

See page 207 for dimensions.

Order by Figure Number.

DIMENSIONS

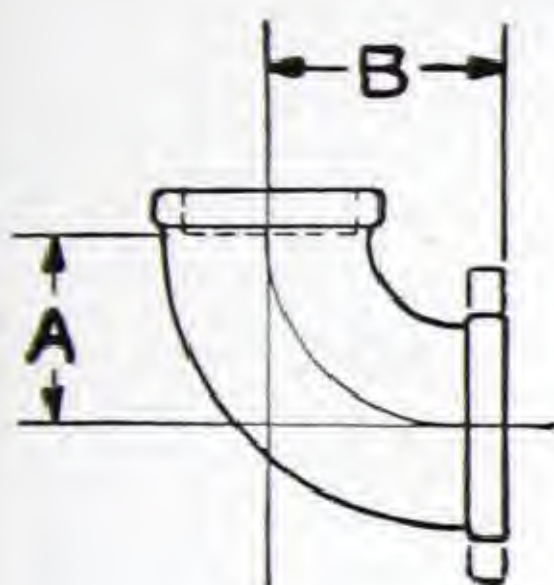
Extra Heavy Long Turn Elbows

250 Lbs. Water Pressure

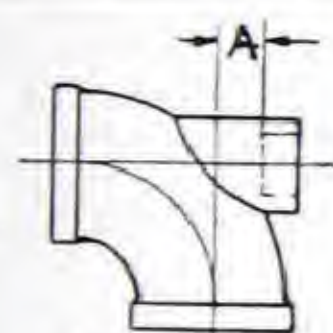
Dimension A—Indicates End of Pipe.

Dimension B—Is same for Flange and Screw.

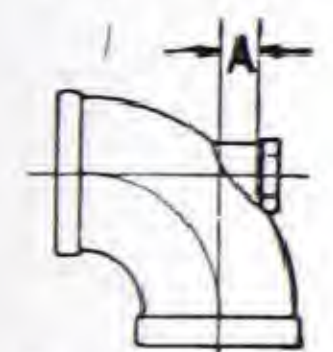
X = Elbows in Stock.



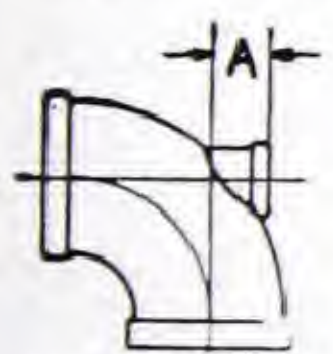
SIZE	DIMENSIONS		STOCK SIZES	
	A	B	Screw No. 324	F. S. No. 325
1½	3½	4½ ³ / ₁₆	X	.....
2	3¾	4½	X	.....
2½	4¼	5¼	X	X
3	4½ ¹¹ / ₁₆	5¾	X	X
3½	5¾	6½	X	X
4	6½ ¹ / ₁₆	7¼	X	X
5	7½ ¹ / ₁₆	8¾	X	X
6	8½	9¾	X	X



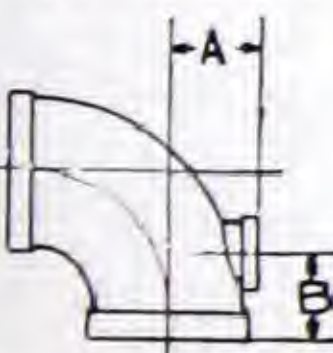
Slip Boss



Screw Boss



Solid Boss



Boss Near Band

Extra Heavy Long Turn Bossed Elbows

250 Lbs. Water Pressure

Solid Bosses, cored for ½", can be tapped size noted and under.

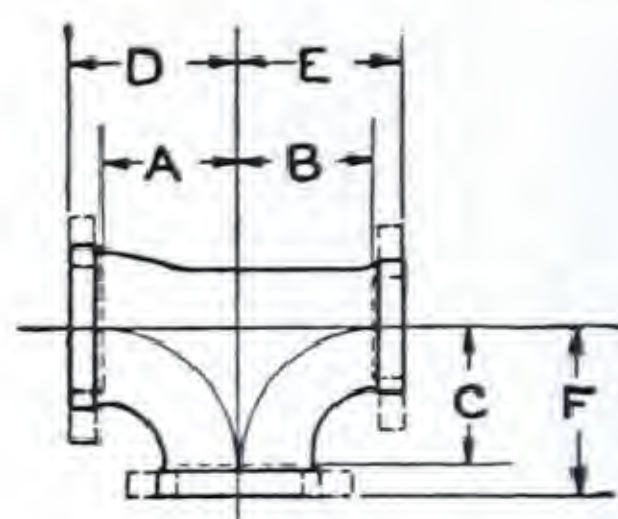
SIZE ELBOW	SIZE BOSS		SCREW ELBOWS			FLANGE & SCREW ELBOWS			
			Boss		Solid Boss Near Band 324-D	Boss Opp. Screw End		Boss Opp. Flg. End	
			Ser. 324-B	Solid 324-C		Ser. 325-B	Solid 325-C	Slip 325-D	Solid 325-E
2½	1½	A	.....	1¾	2¾	.....	1¾	.....	1¾
		B	.....	.....	3½ ⁷ / ₁₆	.....	.....	.....	.....
3	1½	A	.....	1½ ¹⁵ / ₁₆	2¾	.....	1½ ¹⁵ / ₁₆	.....	1½ ¹⁵ / ₁₆
		B	.....	.....	3½ ¹¹ / ₁₆	.....	.....	.....	.....
3½	1½	A	.....	.....	.....	.....	.....	1¾	.....
		B	.....	2⅛	3⅛	.....	2⅛	.....	2⅛
4	2	A	.....	.....	3½ ¹³ / ₁₆	.....	.....	.....	.....
		B	1½	2¼	3½ ⁵ / ₁₆	1½	2¼	2	2¼
5	2	A	.....	.....	4¼	.....	.....	.....	.....
		B	1¾	2⅝	4½ ¹ / ₁₆	1¾	2⅝	.....	2⅝
6	2	A	.....	.....	4¾	.....	.....	.....	.....
		B	2⅛	2⅞	4½	2⅛	2⅞	.....	2⅞
6	2½	A	.....	.....	4½	.....	.....	2¾	.....
		B	.....	.....	.....	.....	.....	.....	.....
6	2½	A	.....	.....	.....	.....	.....	2⅝	.....
		B	.....	.....	.....	.....	.....	.....	.....

Order by Figure Number.

DIMENSIONS AND STOCK SIZES

Extra Heavy Long Turn Tees

250 Lbs. Water Pressure



Dimensions A, B, C indicate End of Pipe.

Dimensions D, E, F are same for Flange and Screw.

X = Tees in stock.

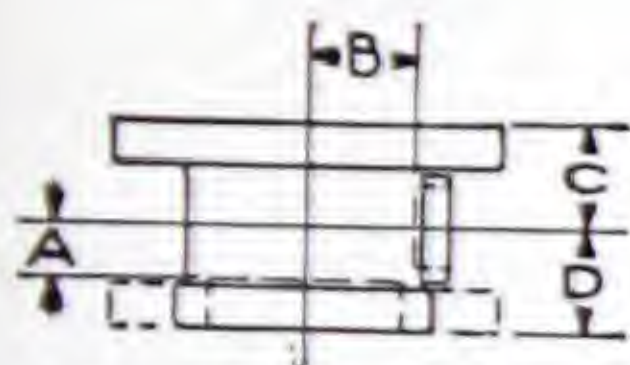
SIZE			DIMENSIONS						STOCK SIZES				
			A	B	C	D	E	F	Ser. 327	F.S.S. 328	F.S.F. 329	S.S.F. 330	F.F.F. 332
1½	1½	1½	3½	3½	3½	4 ³ / ₁₆	4 ³ / ₁₆	4 ³ / ₁₆	X	....	....	....	....
2	2	2	3¾	3¾	3¾	4½	4½	4½	X	....	....	....	....
2½	2½	2½	4¼	4¼	4¼	5¼	5¼	5¼	X	X	X	X	X
3	3	3	4 ¹¹ / ₁₆	4 ¹¹ / ₁₆	4 ¹¹ / ₁₆	5¾	5¾	5¾	X	X	X	X	X
3½	3½	3½	5 ³ / ₈	5 ³ / ₈	5 ³ / ₈	6½	6½	6½	X	X	X	X	X
4	4	4	6 ¹ / ₁₆	6 ¹ / ₁₆	6 ¹ / ₁₆	7¼	7¼	7¼	X	X	X	X	X
5	5	5	7 ¹ / ₁₆	7 ¹ / ₁₆	7 ¹ / ₁₆	8 ³ / ₈	8 ³ / ₈	8 ³ / ₈	X	X	X	X	X
6	6	6	8½	8½	8½	9 ⁷ / ₈	9 ⁷ / ₈	9 ⁷ / ₈	X	X	X	X	X

Order by Figure Number.

DIMENSIONS

Extra Heavy Drip or Drain Tees

250 Lbs. Water Pressure



Dimensions A and B indicate End of Pipe.

C and D are same for Flange and Screw Ends.

† = 2 Tap Bolts Each Flange.

Fig. Nos. 318, 319

SIZE			DIMENSIONS			
			A	B	C	D
2 1/2 †	2 1/2	1 1/2	1 7/16	1 15/16	2 7/16	2 7/16
2 1/2 †	2 1/2	1 1/4	1 5/16	1 7/8	2 5/16	2 5/16
2 1/2 †	2 1/2	1	1 1/8	1 13/16	2 3/16	2 3/16
3 †	3	1 1/2	1 1/2	2 5/16	2 9/16	2 9/16
3 †	3	1 1/4	1 3/8	2 1/4	2 1/2	2 1/2
3 †	3	1	1 3/8	2 5/16	2 1/2	2 1/2
3 1/2 †	3 1/2	2	1 13/16	2 11/16	2 15/16	2 15/16
3 1/2 †	3 1/2	1 1/2	1 13/16	2 3/4	2 15/16	2 15/16
3 1/2 †	3 1/2	1 1/4	1 13/16	2 3/4	2 15/16	2 15/16
4 †	4	2	1 7/8	3	3 1/16	3 1/16
4 †	4	1 1/2	1 7/8	3 1/16	3 1/16	3 1/16
4 †	4	1 1/4	1 7/8	3 1/16	3 1/16	3 1/16
4 †	4	1	1 7/8	3 1/8	3 1/16	3 1/16
4 †	4	3/4	1 7/8	3 3/16	3 1/16	3 1/16
5 †	5	2	2 1/2	3 3/4	3 13/16	3 13/16
5 †	5	1 1/2	2 1/2	3 13/16	3 13/16	3 13/16
5 †	5	1 1/4	2 1/2	3 13/16	3 13/16	3 13/16
5 †	5	1	2 1/2	3 7/8	3 13/16	3 13/16
6 †	6	2 1/2	3 3/16	4 1/4	4 9/16	4 9/16
6 †	6	2	2 1/8	4 1/8	3 1/2	3 1/2
6 †	6	1 1/2	2 1/8	4 3/16	3 1/2	3 1/2
6 †	6	1 1/4	2 1/8	4 3/16	3 1/2	3 1/2
6 †	6	1	2 1/8	4 1/4	3 1/2	3 1/2
8 †	8	3	4 9/16	5 7/8	6 1/16	6 1/16
8 †	8	2 1/2	4 9/16	5 15/16	6 1/16	6 1/16
8 †	8	2	4 9/16	6 3/16	6 1/16	6 1/16

Order by Figure Number.

GRINNELL CAST IRON DRAINAGE FITTINGS

Recessed and Threaded for Wrought Pipe

To meet the increasing demand of the trade we have equipped to furnish a complete line of drainage fittings, the various styles, sizes and dimensions of which are illustrated and given on the following pages.

All these Drainage Fittings are well proportioned. They have sufficient sweep to give free, unobstructed flow. See illustration on opposite page.

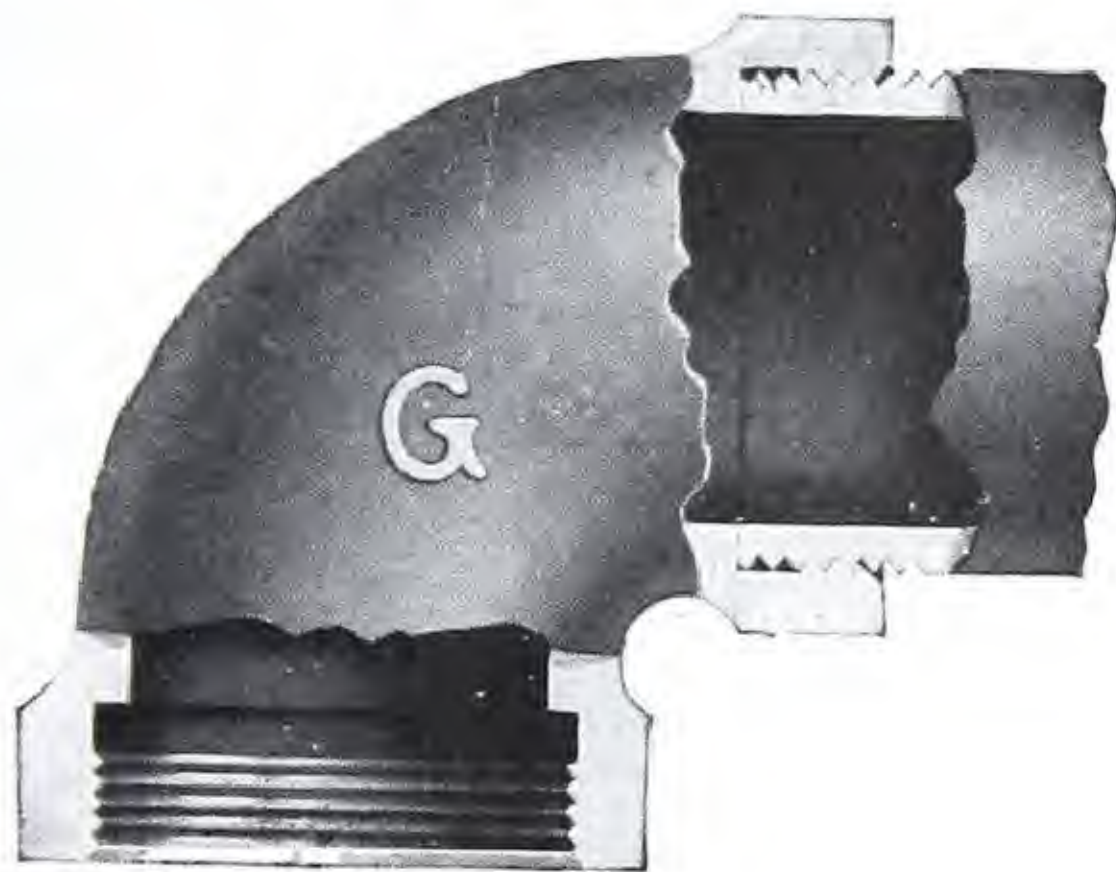
Our complete galvanizing and dipping plant insures delivery at short notice of these fittings, either galvanized, asphalt or oil dipped. All of these processes of dipping are the most up-to-date practice and insure a coating that is substantial and acts as a preservative or a protective where conditions require it.

The dimensions which are included in the following pages will prove of assistance to architects and engineers in making up sketches covering requirements.

In addition to this complete line, we are in a position to furnish irregular styles and sizes of fittings which we do not illustrate, viz:—Vent Elbows, Vent Elbows with Base, special Long T-Y's, etc., etc.

GRINNELL CAST IRON DRAINAGE FITTINGS

Recessed and Threaded for Wrought Pipe

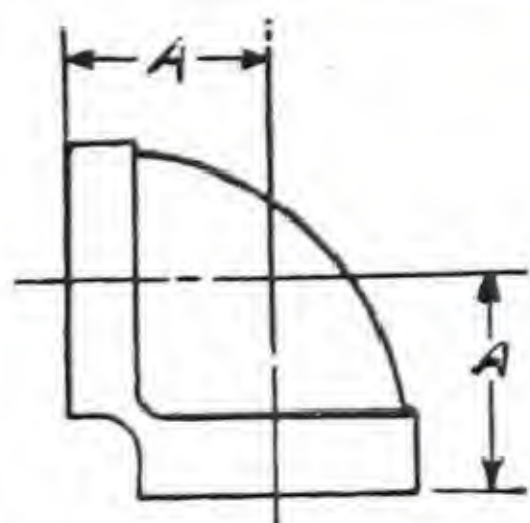


As shown in the above sectional view, these Fittings are made with a shoulder, and being the same diameter as the inside of the pipe a continuous passage is made when the pipe is screwed up to the shoulder, thus allowing no place for solid matter to collect and clog the pipe.

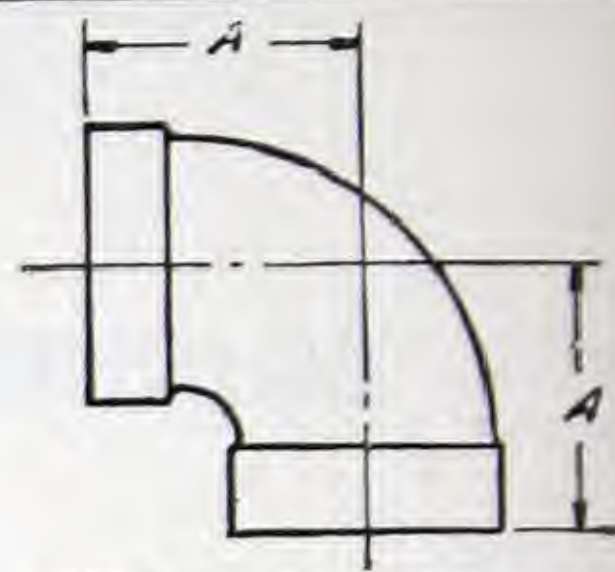
See preceding page for general information.

GRINNELL CAST IRON DRAINAGE FITTINGS

Elbows



90° Short Turn Elbows
Fig. No. 701



90° Long Turn Elbows
Fig. No. 702

Size	Inches	1 1/4	1 1/2	2	2 1/2	3	4
Fig. 701. Dimension A	Inches	1 3/4	2 5/8	2 3/8	2 13/16	3 5/8	3 13/16
Fig. 702. Dimension A	Inches	2 1/4	2 1/2	3 1/8	3 11/16	4 1/4	5 5/8
Fig. 701. Black	Each	.30	.38	.57	1.20	1.45	2.30
Galvanized	Each	.52	.67	1.00	2.10	2.55	4.00
Fig. 702. Black	Each	.35	.42	.65	1.40	1.75	2.75
Galvanized	Each	.60	.72	1.15	2.45	3.10	4.80

Size	Inches	5	6	7	8	10
Fig. 701. Dimension A	Inches	4 1/2	5 5/8	5 13/16	6 1/2	7 3/4
Fig. 702. Dimension A	Inches	6 1/8	7 1/8	8 1/8	9	11
Fig. 701. Black	Each	4.25	6.25	11.50	15.00	31.00
Galvanized	Each	7.40	11.00	20.00	26.25	54.00
Fig. 702. Black	Each	5.25	7.50	13.50	19.00	38.00
Galvanized	Each	9.20	13.15	23.50	33.25	66.50

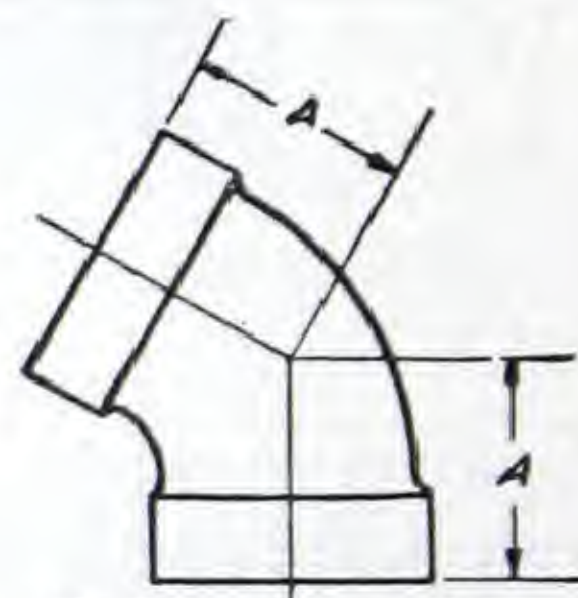
90° EXTRA LONG TURN ELBOWS—Fig. No. 702-A.

Size	Inches	1 1/4	1 1/2	2	2 1/2	3
Dimension A	Inches	3	3 1/2	4	.....	5 1/2
Fig No. 702-A, Black	Each	.35	.42	.65	.....	1.75
Galvanized	Each	.60	.72	1.15	.....	3.10

90° Elbows are tapped, pitched 1/4 inch to the foot.



60° Short Turn Elbows
Fig. No. 703



60° Long Turn Elbows
Fig. No. 704

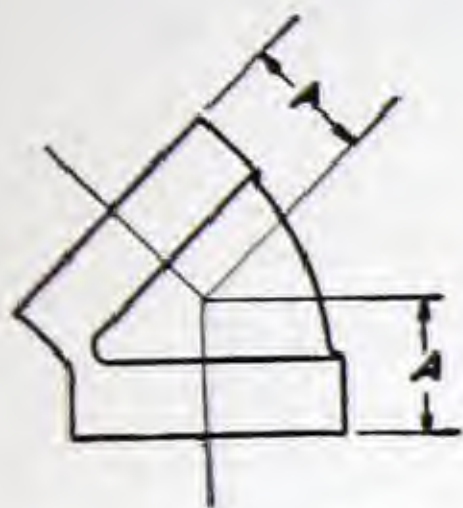
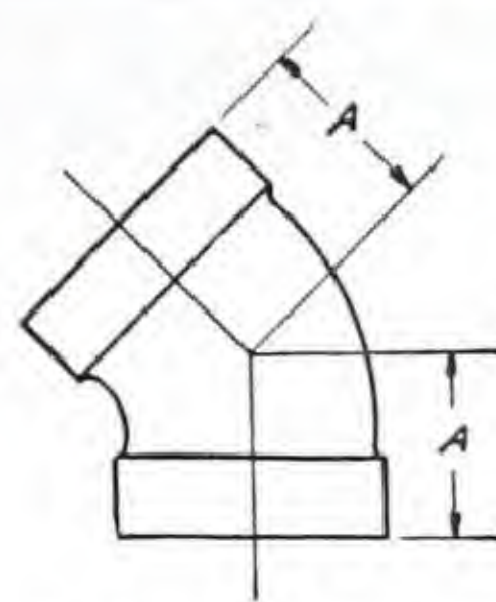
Size	Inches	1 1/4	1 1/2	2	2 1/2	3	4
Fig. 703. Dimension A	Inches	1 5/8	1 3/4	2	2 1/2	2 7/8	3 3/8
Fig. 704. Dimension A	Inches	2	2 1/4	2 5/8	2 13/16	3 5/8	4
Fig. 703. Black	Each	.30	.38	.57	1.20	1.45	2.30
Galvanized	Each	.52	.67	1.00	2.10	2.55	4.00
Fig. 704. Black	Each	.35	.42	.65	1.40	1.75	2.75
Galvanized	Each	.60	.72	1.15	2.45	3.10	4.80

Size	Inches	5	6	7	8	10
Fig. 703. Dimension A	Inches	3 7/8	4 5/8	4 1/2	5 3/8	6 1/4
Fig. 704. Dimension A	Inches	.....	.....	.....	.....	.....
Fig. 703. Black	Each	4.25	6.25	11.50	15.00	31.00
Galvanized	Each	7.40	11.00	20.00	26.25	54.00
Fig. 704. Black	Each	5.25	7.50	13.50	19.00	38.00
Galvanized	Each	9.20	13.15	23.50	33.25	66.50

Dimensions subject to a slight variation and change without notice.
Order by Figure Number.

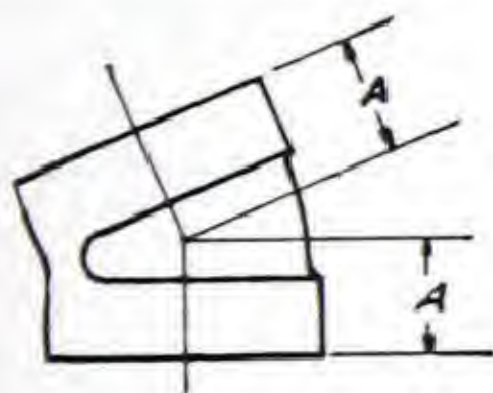
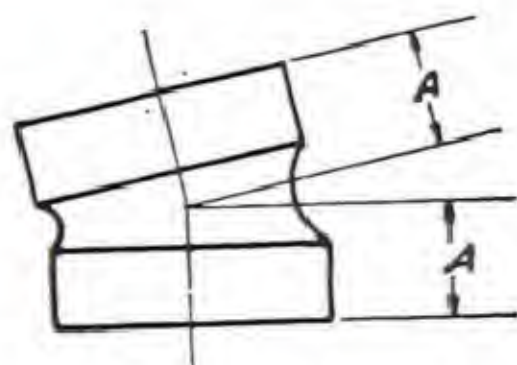
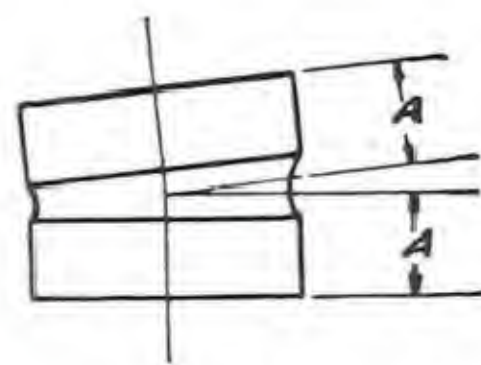
GRINNELL CAST
IRON DRAINAGE
FITTINGS

Elbows

45° Short Turn Elbows
Fig. No. 70545° Long Turn Elbows
Fig. No. 706

Size	Inches	1 1/4	1 1/2	2	2 1/2	3	4
Fig. 705. Dimension A ..	Inches	1 3/8	1 7/16	1 3/4	2 1/8	2 3/8	2 3/4
Fig. 706. Dimension A ..	Inches	1 3/4	1 7/8	2 1/4	2 5/8	2 7/8	3 1/16
Fig. 705. Black	Each	.30	.38	.57	1.20	1.45	2.30
Galvanized	Each	.52	.67	1.00	2.10	2.55	4.00
Fig. 706. Black	Each	.35	.42	.65	1.40	1.75	2.75
Galvanized	Each	.60	.72	1.15	2.45	3.10	4.80

Size	Inches	5	6	7	8	10
Fig. 705. Dimension A ..	Inches	3 3/16	3 1/2	3 7/8	4 3/16	4 7/8
Fig. 706. Dimension A ..	Inches	4 1/8	4 7/8	5 1/2	6	7 1/2
Fig. 705. Black	Each	4.25	6.25	11.50	15.00	31.00
Galvanized	Each	7.40	11.00	20.00	26.25	54.00
Fig. 706. Black	Each	5.25	7.50	13.50	19.00	38.00
Galvanized	Each	9.20	13.15	23.50	33.25	66.50

22 1/2° Elbows
Fig. No. 70711 1/4° Elbows
Fig. No. 7085 5/8° Elbows
Fig. No. 709

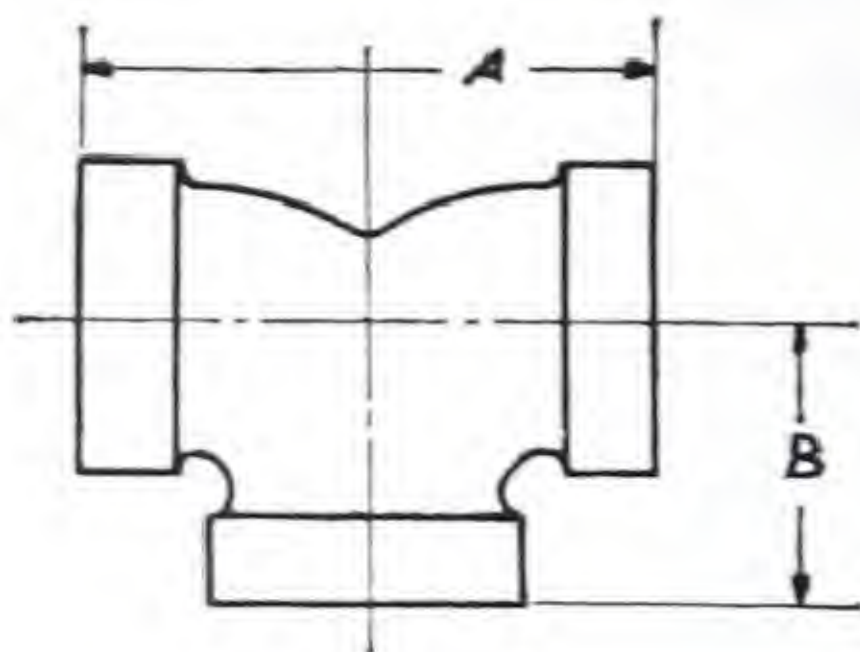
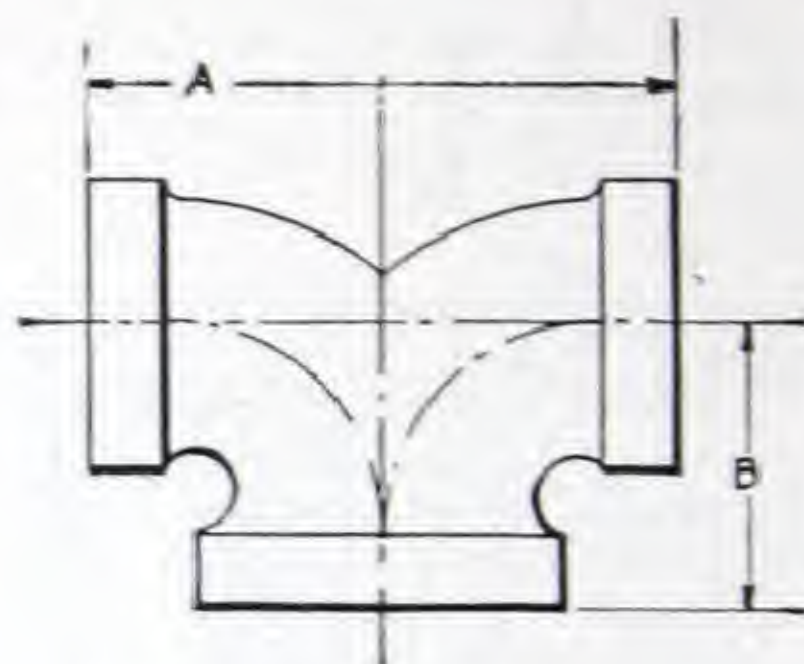
Size	Inches	1 1/4	1 1/2	2	2 1/2	3	4
Fig. 707. Dimension A ..	Inches	1 1/8	1 1/4	1 7/16	1 3/4	2	2 5/16
Fig. 708. Dimension A ..	Inches	1 1/8	1 3/8	1 13/16	1 3/2	1 13/16	2 1/8
Fig. 709. Dimension A ..	Inches	1 1/8	1 5/16	1 1/2	1 5/8	1 3/4	2
Fig. 707. Black	Each	.30	.38	.57	1.20	1.45	2.30
Galvanized	Each	.52	.67	1.00	2.10	2.55	4.00
Fig. 708. Black	Each	.30	.38	.57	1.20	1.45	2.30
Galvanized	Each	.52	.67	1.00	2.10	2.55	4.00
Fig. 709. Black	Each	.30	.38	.57	1.20	1.45	2.30
Galvanized	Each	.52	.67	1.00	2.10	2.55	4.00

Size	Inches	5	6	7	8	10
Fig. 707. Dimension A ..	Inches	2 5/8	2 5/16	3 1/4	3 9/16	3 7/8
Fig. 708. Dimension A ..	Inches	2 3/8	2 1/2	2 5/8	2 3/4	3
Fig. 709. Dimension A ..	Inches	2 1/4	2 5/16	2 3/8	2 1/2	2 3/4
Fig. 707. Black	Each	4.25	6.25	11.50	15.00	31.00
Galvanized	Each	7.40	11.00	20.00	26.25	54.00
Fig. 708. Black	Each	4.25	6.25	11.50	15.00	31.00
Galvanized	Each	7.40	11.00	20.00	26.25	54.00
Fig. 709. Black	Each	4.25	6.25	11.50	15.00	31.00
Galvanized	Each	7.40	11.00	20.00	26.25	54.00

Dimensions subject to a slight variation and change without notice.
Order by Figure Number.

GRINNELL CAST IRON DRAINAGE FITTINGS

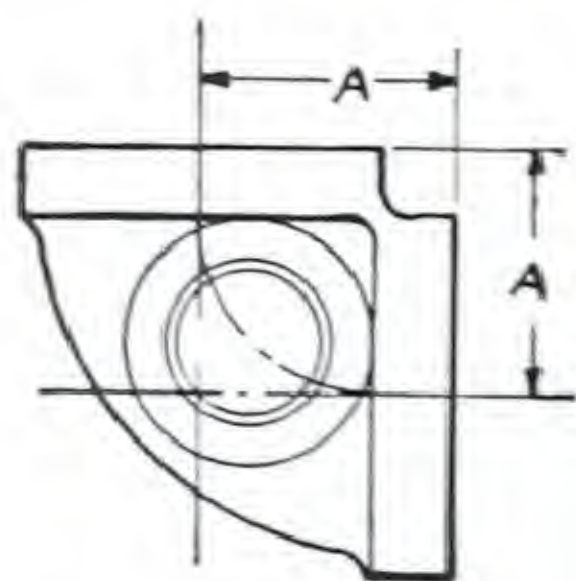
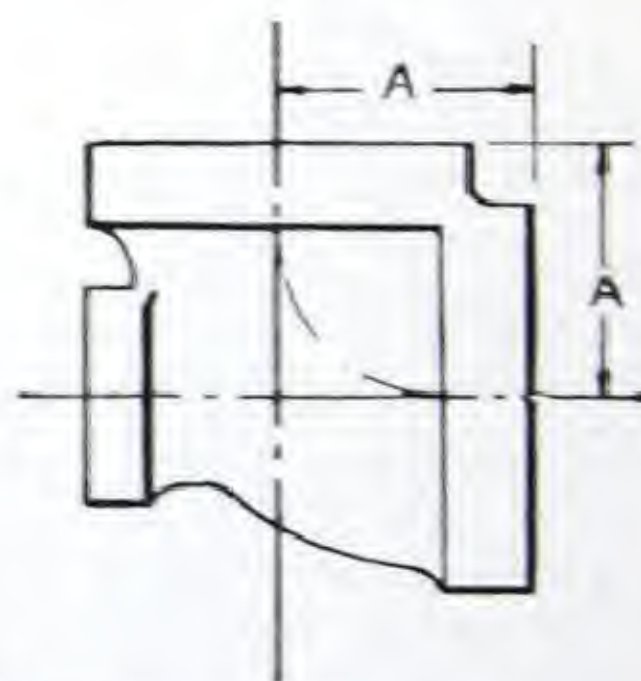
Elbows

3-Way Elbows
Fig. No. 710Reducing 3-Way Elbows
Fig. No. 711

Size.....Inches	1 1/4	1 1/2	2	2 1/2	3	4
Dimension A.....Inches	4 1/8	5 1/4	6 1/4	7 3/8	8 5/8	10 3/8
Dimension B.....Inches	2 1/4	2 5/8	3 1/8	3 11/16	4 5/8	5 3/4
Figs. 710, 711. Black..Each	.75	.85	1.10	2.25	3.00	5.00
Galvanized..Each	1.25	1.50	1.95	3.90	5.25	8.75

Size.....Inches	4x3	5	5x4	6	6x4	6x5
Dimension A.....Inches	9 1/2	12 1/4	11 3/8	14 1/4	12 3/8	13 3/8
Dimension B.....Inches	4 5/8	6 1/8	5 5/8	7 1/8	5 7/8	6 1/2
Figs. 710, 711. Black..Each	5.50	7.50	8.25	13.50	15.00	15.00
Galvanized..Each	9.65	13.15	14.50	23.50	26.25	26.25

Inlets of 3-Way Elbows are tapped, pitched 1/4 inch to the foot.

90° Elbows with Side Inlet
Fig. No. 71290° Elbows with Heel Inlet
Fig. No. 713

	Size	Dimension A	Size of Inlet	Price Black, Ea.	Price Galv., Ea.
Fig. 712	4	3 5/8	2	3.85	6.75
Fig. 713	4	3 5/8	2	3.85	6.75

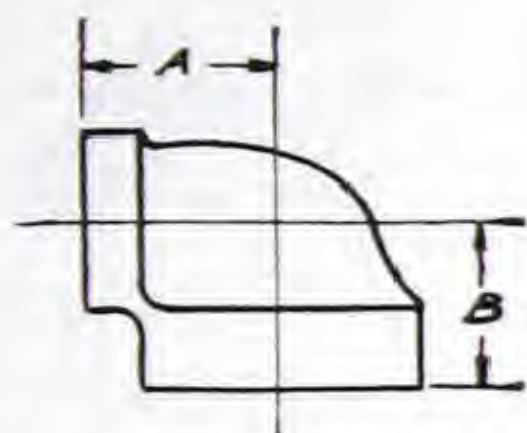
Tapped, pitched 1/4 inch to the foot.

Dimensions subject to a slight variation and change without notice.

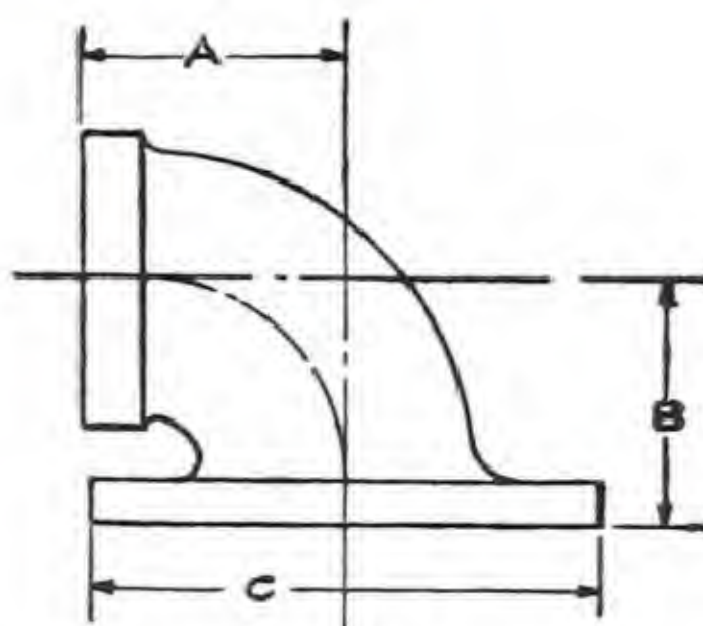
Order by Figure Number.

GRINNELL CAST IRON DRAINAGE FITTINGS

Closet Elbows and Flanges



Reducing Closet Elbows
Fig. No. 714

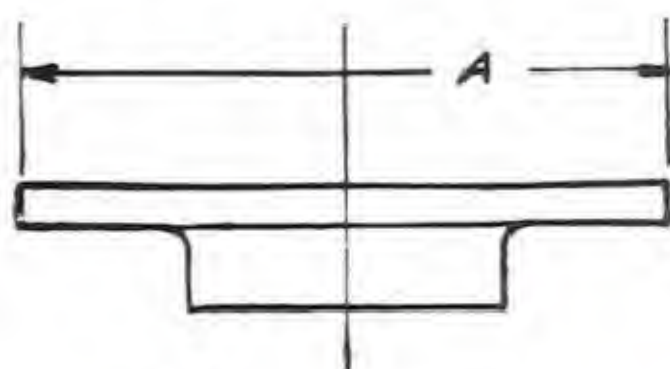


Closet Elbows with Flange
Fig. No. 715

CLOSET ELBOWS—Fig. Nos. 714, 715

	Size	Dimensions			Black Each	Galv. Each
		A	B	Diam. C		
Fig. 714	4x5	4 $\frac{7}{16}$	3 $\frac{13}{16}$	7	4.25	7.40
Fig. 715	4	3 $\frac{13}{16}$	4 $\frac{5}{8}$	7	4.25	7.40

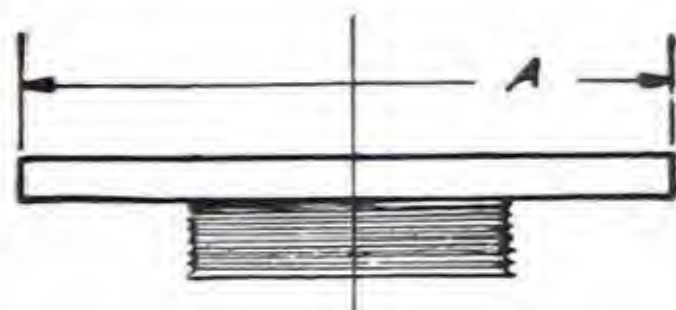
Tapped, pitched $\frac{1}{4}$ inch to the foot.



Closet Flanges
Fig. No. 716

CLOSET FLANGES—Fig. No. 716

Size	Inches	4	5
Diameter of Flange A	Inches	7	10
Fig. 716. Black	Each	1.70	1.70
Galvanized	Each	2.95	2.95



Brass Closet Flanges
Fig. No. 717

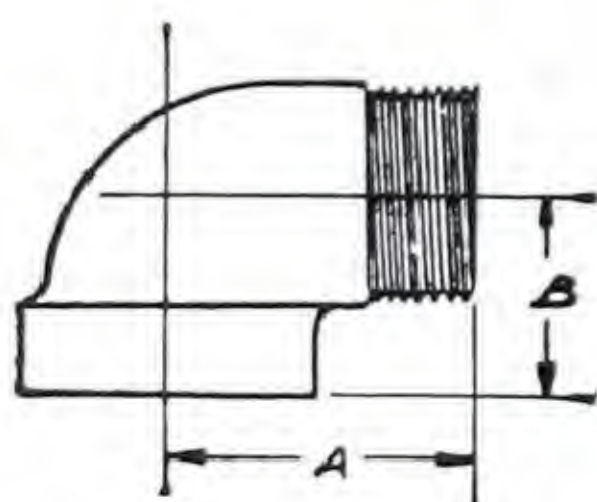
BRASS CLOSET FLANGES—Fig. No. 717

Size	Inches	5
Diameter of Flange A	Inches	7 $\frac{1}{2}$
Fig. 717	Each	7.00

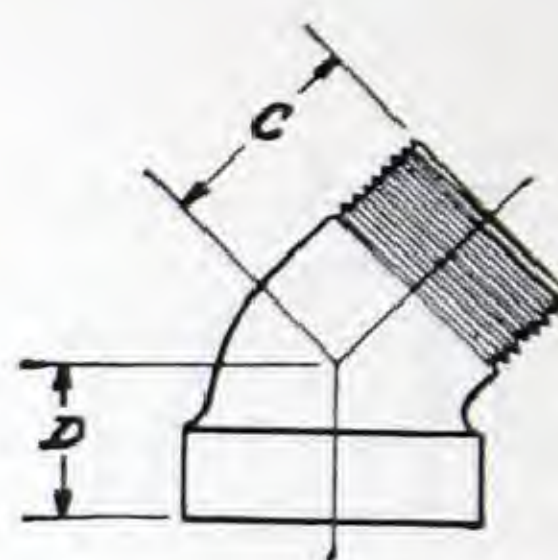
Dimensions subject to a slight variation and change without notice.
Order by Figure Number.

GRINNELL CAST IRON DRAINAGE FITTINGS

Elbows



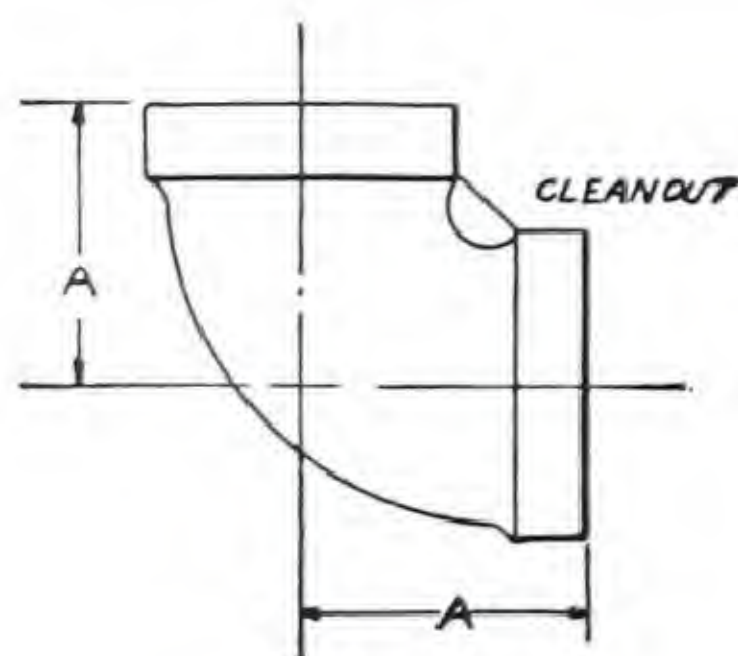
90° Street Elbow
Fig. No. 718



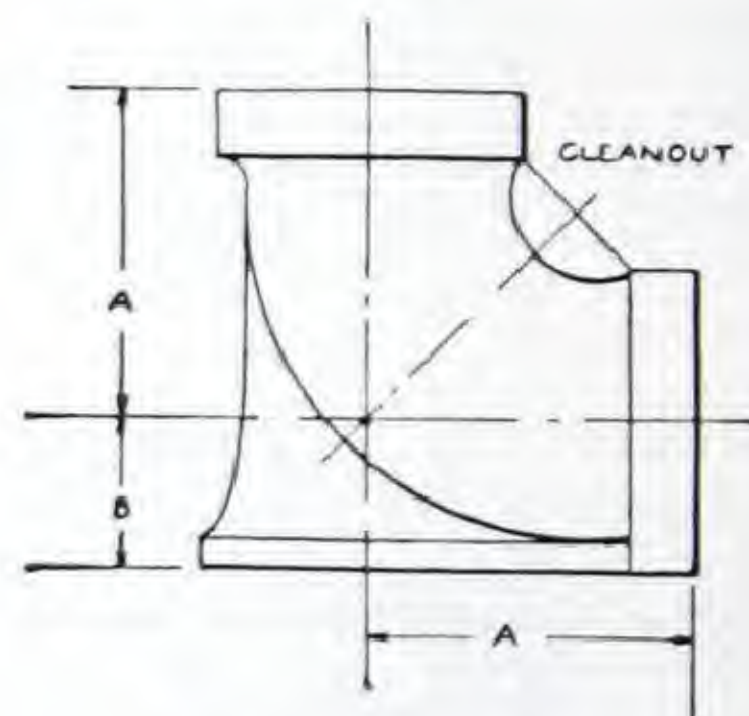
45° Street Elbow
Fig. No. 719

STREET ELBOWS—Fig. Nos. 718, 719

Size	Inches	1 1/4	1 1/2	2
Dimension A	Inches	2 1/2	2 5/8	3 1/4
Dimension B	Inches	1 5/8	1 3/4	2 1/4
Dimension C	Inches	1 3/4	2	2 1/4
Dimension D	Inches	1 1/4	1 1/4	1 1/2
Figs. 718, 719. Black	Each	.35	.40	.60
Galvanized	Each	.60	.70	1.10



90° Long Turn Elbow
With Cleanout
Fig. No. 720

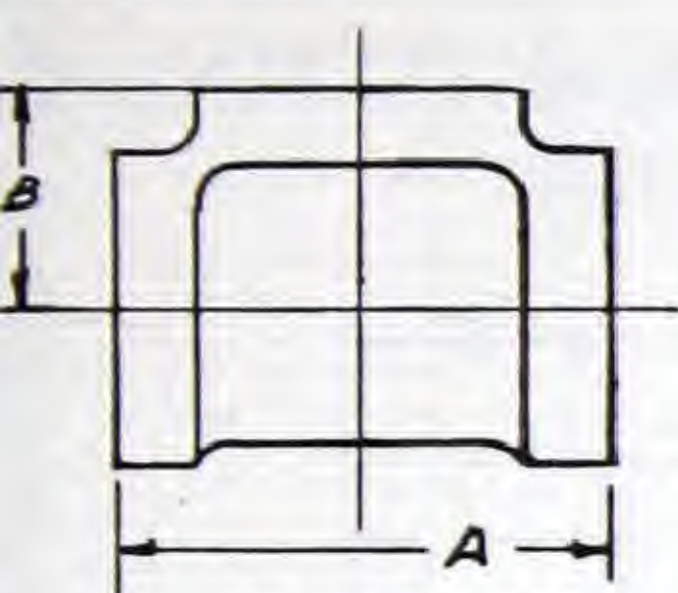


90° Long Turn Elbow
With Cleanout—With Base
Fig. No. 721

90° LONG TURN ELBOWS WITH CLEANOUT—Fig. Nos. 720, 721

Size	Inches	2	3	4	5	6
Dimension A	Inches	..	..	6 1/4	7	8 1/4
Dimension B	Inches	..	..	2 7/8	3 3/4	4 1/2
Size of Cleanout	Inches	..	..	2	2	2 1/2
Fig. 720. Black	Each	1.20	3.00	5.00	7.50	10.00
Galvanized	Each	2.10	5.25	8.75	13.00	17.50
Fig. 721. Black	Each	3.00	4.50	7.00	12.00	18.00
Galvanized	Each	5.25	8.00	12.25	21.00	31.50

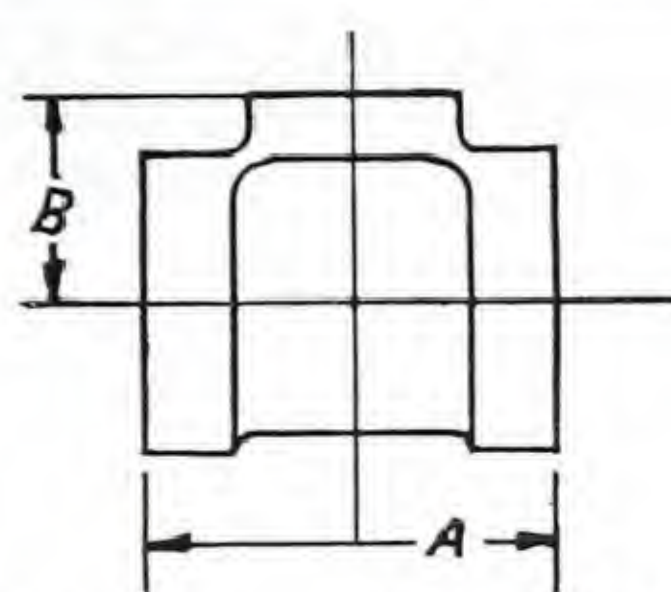
Long Turn Elbows are tapped, pitched 1/4 inch to the foot.
Dimensions subject to a slight variation and change without notice.
Order by Figure Number.



Tees—Fig. No. 722

GRINNELL CAST IRON DRAINAGE FITTINGS

*Tees—Basin Tees
and Crosses*



Reducing Tees—Fig. No. 723

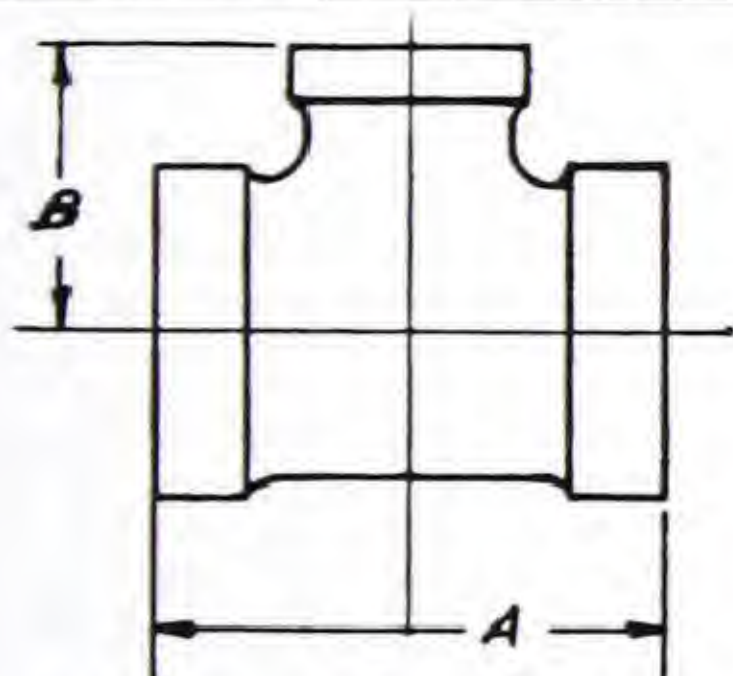
TEES—Fig. No. 722

Size.....Inches	1¼	1½	2	2½	3	4
Dimension A.....Inches	3½	4⅜	4⅝	5⅝	6⅜	7⅝
Dimension B.....Inches	1¾	2⅜	2⅝	2⅞	3⅜	3⅝
Fig. 722. Black.....Each	.45	.55	.80	1.50	2.00	3.25
Galvanized.....Each	.80	1.00	1.40	2.50	3.50	5.70

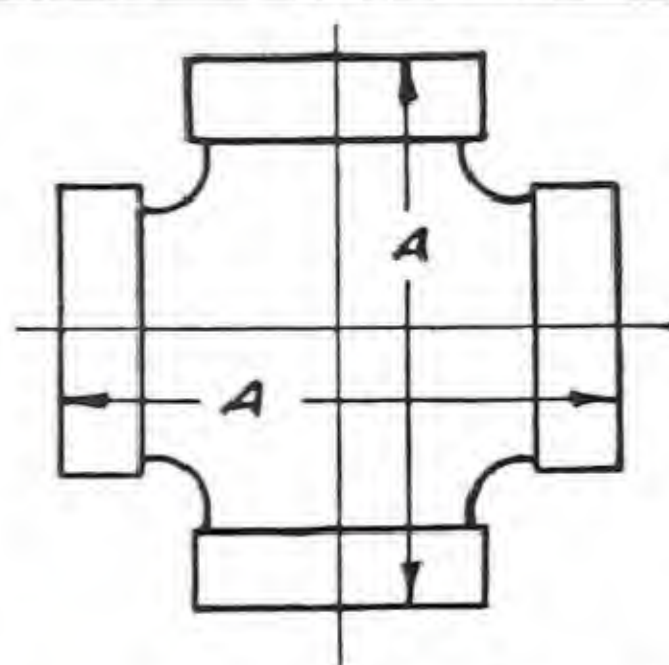
Size.....Inches	5	6	7	8	10
Dimension A.....Inches	9¼	10⅜	11⅝	13	15½
Dimension B.....Inches	4⅝	5⅜	5⅞	6½	7¾
Fig. 722. Black.....Each	6.00	8.75	16.00	21.00	43.00
Galvanized.....Each	10.50	15.25	28.00	37.00	75.00

REDUCING TEES—Fig. No. 723

Size.....Inches	2x1½	2½x2	3x2	4x2	4x3	5x2	5x3	5x4	6x4
Dimension A.....Inches	4⅞	4¾	5½	6	7	6	6⅞	.....	.....
Dimension B.....Inches	2¼	3	3	3⅞	3¾	4⅞	4⅞	.....	.....
Fig. 723. Black.....Each	.90	1.65	2.20	3.60	3.60	6.60	6.60	6.60	9.60
Galvanized.....Each	1.60	2.75	3.85	6.30	6.30	11.55	11.55	11.55	16.75



Basin Tees—Fig. No. 724



Basin Crosses—Fig. No. 725

BASIN TEES—Fig. No. 724

Size.....Inches	1¼	1½	1½x1¼	2	2x1¼	2x1½	2½
Dimension A.....Inches	4⅝	5⅜	5⅞	7	6¼	6½	8½
Dimension B.....Inches	2⅝	2⅞	2⅞	3½	3⅞	3¼	4¼
Fig. 724. Black.....Each	.60	.70	.77	1.10	1.20	1.20	1.75
Galvanized.....Each	1.00	1.22	1.35	1.95	2.10	2.10	3.00

BASIN CROSSES—Fig. No. 725

Size.....Inches	1¼	1½	2	2x1½
Dimension A.....Inches	4⅝	5⅜	7	6½
Fig. 725. Black.....Each	1.25	1.50	1.75	1.95
Galvanized.....Each	2.25	2.50	3.10	3.40

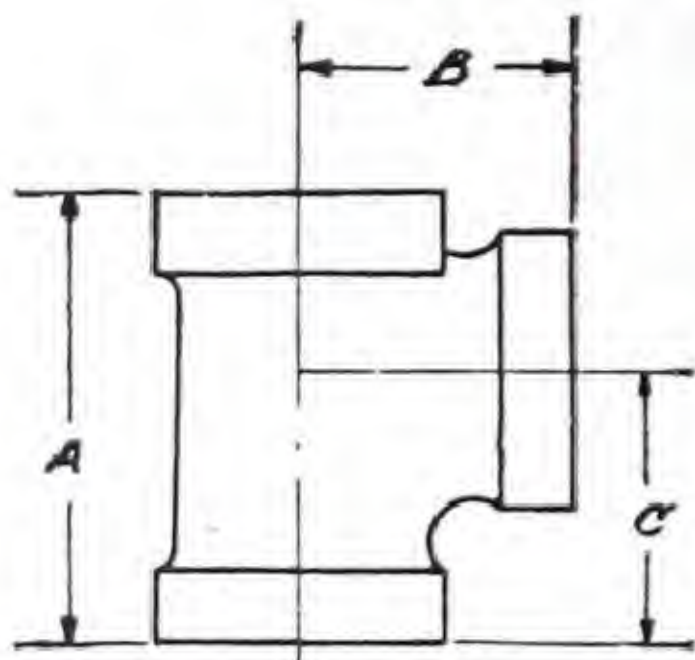
The Inlets of Tees, Basin Tees and Crosses are tapped, pitched ¼ inch to the foot.

The Inlets of Reducing Fittings are always the smallest openings.

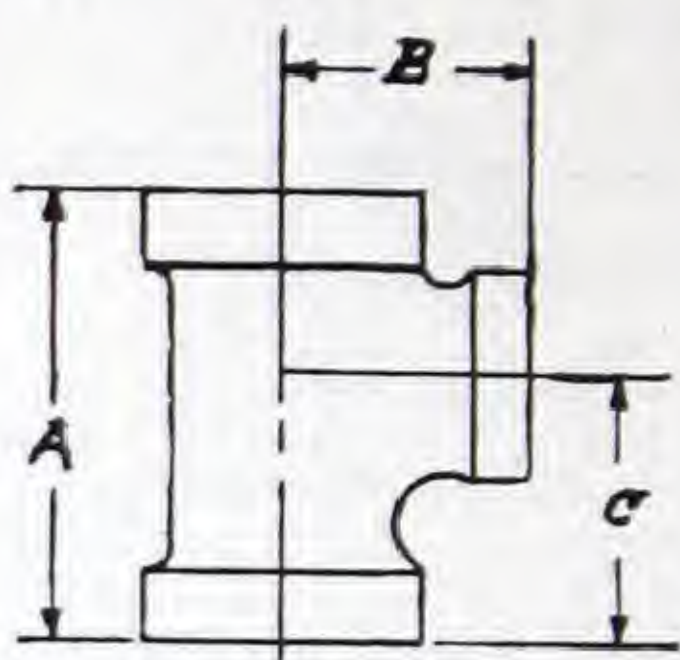
Dimensions subject to a slight variation and change without notice.

Order by Figure Number.

GRINNELL CAST IRON DRAINAGE FITTINGS
90° Short Turn Y-Branches



90° Short Turn Y-Branches
Tee Pattern
Fig. No. 726



Reducing 90° Short Turn Y-Branches
Tee Pattern
Fig. No. 727

90° SHORT TURN Y-BRANCHES, TEE PATTERN—Fig. No. 726

Size.....Inches	1 1/4	1 1/2	2	2 1/2	3	4	5	6	7	8	10
Dimension A.....Inches	3 3/4	4 1/4	5 5/16	6 5/16	7 1/4	8 3/4	10 5/16	11 15/16	13 5/8	15 1/16	20
Dimension B.....Inches	2 1/4	2 1/2	3 1/16	3 11/16	4 1/4	5 3/16	6 1/8	7 1/8	8 1/8	9	11 3/8
Dimension C.....Inches	2 1/4	2 1/2	3 1/16	3 11/16	4 1/4	5 3/16	6 1/8	7 1/8	8 1/8	9	11 3/8
Fig. 726. Black.....Each	.45	.57	.85	1.80	2.20	3.50	6.50	9.50	17.50	23.00	47.00
Galvanized.. Each	.80	1.00	1.50	3.15	3.85	6.15	11.35	16.50	30.50	40.00	82.00

REDUCING 90° SHORT TURN Y-BRANCHES, TEE PATTERN
Fig. No. 727

Size.....Inches	1 1/2x1 1/4	2x1 1/4	2x1 1/2	2 1/2x1 1/4	2 1/2x1 1/2	2 1/2x2	3x1 1/4	3x1 1/2	3x2
Dimension A.....Inches	3 7/8	....	4 5/8	4 3/8	4 7/8	5 1/2	....	5 1/16	5 11/16
Dimension B.....Inches	2 1/2	....	2 15/16	2 15/16	3 1/16	3 5/16	....	3 5/16	3 5/8
Dimension C.....Inches	2 3/8	....	2 11/16	2 1/2	2 13/16	3 1/4	....	2 15/16	3 5/16
Fig. 727. Black.....Each	.63	.95	.95	2.00	2.00	2.00	2.40	2.40	2.40
Galvanized.. Each	1.10	1.65	1.65	3.50	3.50	3.50	4.20	4.20	4.20

Size.....Inches	4x1 1/2	4x2	4x2 1/2	4x3	3x4	5x1 1/2	5x2	5x2 1/2	5x3
Dimension A.....Inches	5 1/4	5 13/16	6 5/8	7 3/8	8 5/8	5 9/16	6 1/8	6 15/16	7 3/4
Dimension B.....Inches	3 13/16	4 1/16	4 7/16	4 3/4	5 5/16	4 3/8	4 5/8	4 7/8	5 1/4
Dimension C.....Inches	3	3 3/8	3 13/16	4 5/16	5 1/8	3 3/16	3 9/16	4	4 1/2
Fig. 727. Black.....Each	3.85	3.85	3.85	3.85	3.85	7.15	7.15	7.15	7.15
Galvanized.. Each	6.75	6.75	6.75	6.75	6.75	12.50	12.50	12.50	12.50

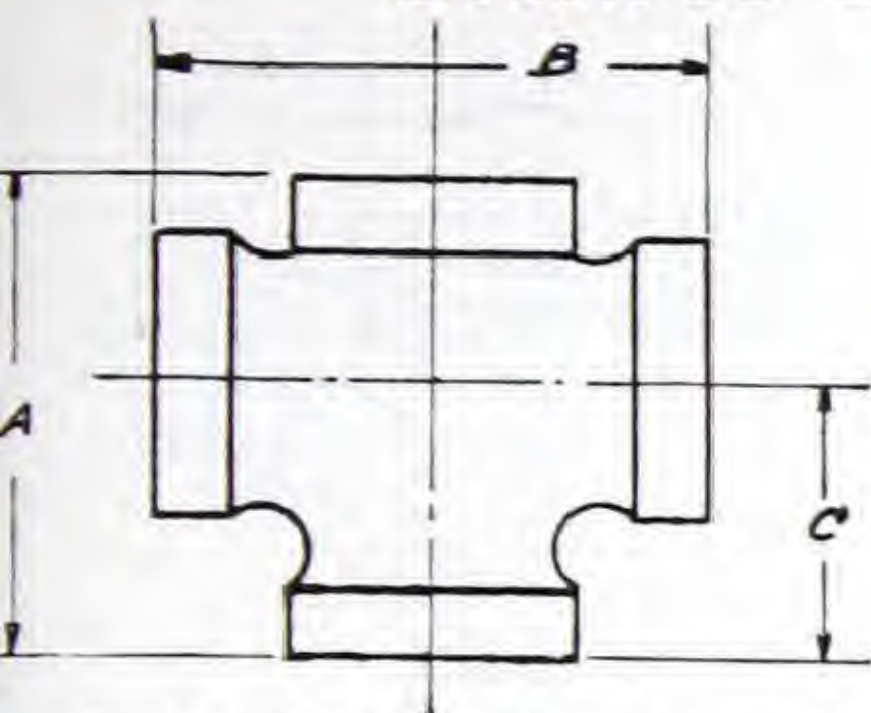
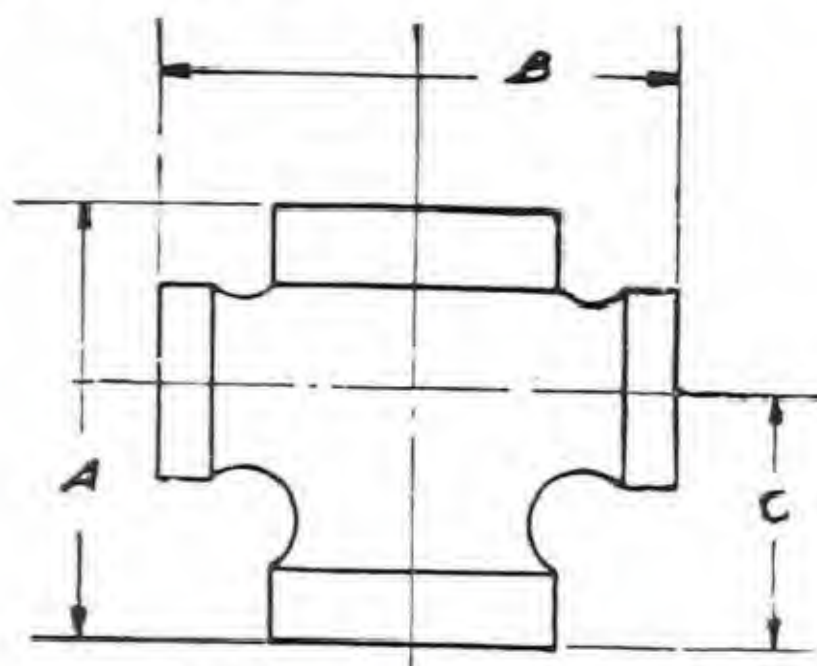
Size.....Inches	5x4	6x1 1/2	6x2	6x2 1/2	6x3	6x4	6x5	7x4	7x6
Dimension A.....Inches	9 1/8	....	6 1/4	....	7 7/8	9 1/4	10 9/16	....	....
Dimension B.....Inches	5 11/16	....	5 1/8	....	5 3/4	6 5/16	6 5/8	....	....
Dimension C.....Inches	5 3/8	....	3 5/8	....	4 9/16	5 7/16	6 1/4	....	....
Fig. 727. Black.....Each	7.15	10.50	10.50	10.50	10.50	10.50	10.50	19.00	19.00
Galvanized.. Each	12.50	18.50	18.50	18.50	18.50	18.50	18.50	33.25	33.25

Size.....Inches	8x2	8x3	8x4	8x5	8x6	10x4	10x6	10x8
Dimension A.....Inches	....	11 7/16	11 7/16	....	15 1/16	....	....	....
Dimension B.....Inches	....	7 1/4	7 9/16	....	8 1/2	....	....	....
Dimension C.....Inches	....	7 15/16	7 1/2	....	10	....	....	....
Fig. 727. Black.....Each	25.50	25.50	25.50	25.50	25.50	52.00	52.00	52.00
Galvanized.. Each	44.50	44.50	44.50	44.50	44.50	88.00	88.00	88.00

The Inlets of 90° Y-Branches are tapped, pitched 1/4 inch to the foot.
The Inlets of Reducing Fittings are always the smallest openings.
Dimensions subject to a slight variation and change without notice.
Order by Figure Number.

GRINNELL CAST IRON DRAINAGE FITTINGS

Double 90° Short Turn Y-Branches

Double 90° Short Turn Y-Branches
Tee Pattern—Fig. No. 728Reducing Double 90° Short Turn Y-Branches
Tee Pattern—Fig. No. 729DOUBLE 90° SHORT TURN Y-BRANCHES
TEE PATTERN—Fig. No. 728

Size.....Inches	1 1/4	1 1/2	2	2 1/2	3	4
Dimension A.....Inches	3 3/4	4 1/4	5 3/16	6 5/16	7 1/4	8 3/4
Dimension B.....Inches	4 1/2	5	6 1/8	7 3/8	8 1/2	10 3/8
Dimension C.....Inches	2 1/4	2 1/2	3 1/16	3 11/16	4 1/4	5 3/16
Fig. 728. Black.....Each	.70	.85	1.30	2.85	3.40	5.25
Galvanized.....Each	1.22	1.50	2.30	5.00	5.95	9.20

Size.....Inches	5	6	7	8	10
Dimension A.....Inches	10 5/16	11 15/16	13 5/8	15 1/16	20
Dimension B.....Inches	12 1/4	14 1/4	16 1/4	18	22 3/4
Dimension C.....Inches	6 1/8	7 1/8	8 1/8	9	11 3/8
Fig. 728. Black.....Each	9.50	14.00	25.00	36.00	60.00
Galvanized.....Each	16.50	24.50	42.50	62.00	102.00

REDUCING DOUBLE 90° SHORT TURN Y-BRANCHES,
TEE PATTERN—Fig. No. 729

Size.....Inches	1 1/2 x 1 1/4	2 x 1 1/4	2 x 1 1/2	2 1/2 x 1 1/2	2 1/2 x 2	3 x 1 1/2	3 x 2
Dimension A.....Inches	3 7/8	....	4 5/8	....	5 1/2	5 1/16	5 11/16
Dimension B.....Inches	5	....	5 7/8	....	6 5/8	6 5/8	7 1/4
Dimension C.....Inches	2 3/8	....	2 11/16	....	3 1/4	2 15/16	3 5/16
Fig. 729. Black.....Each	.95	1.50	1.50	3.15	3.15	3.75	3.75
Galvanized.....Each	1.65	2.60	2.60	5.50	5.50	6.55	6.55

Size.....Inches	4 x 2	4 x 3	5 x 2	5 x 3	5 x 4	6 x 2	6 x 3	6 x 4
Dimension A.....Inches	5 13/16	....	....	....	9 1/8	6 1/4	....	9 1/4
Dimension B.....Inches	8 1/8	....	....	....	11 3/8	10 1/4	....	12 3/8
Dimension C.....Inches	3 3/8	....	....	....	5 3/8	3 5/8	....	5 7/16
Fig. 729. Black.....Each	5.75	5.75	10.50	10.50	10.50	15.50	15.50	15.50
Galvanized.....Each	10.00	10.00	18.50	18.50	18.50	27.00	27.00	27.00

Size.....Inches	6 x 5	7 x 4	8 x 3	8 x 4	8 x 6	10 x 4	10 x 6	10 x 8
Dimension A.....Inches	10 9/16	....	....	....	15 1/16	....	....	....
Dimension B.....Inches	13 1/4	....	....	....	17	....	....	....
Dimension C.....Inches	6 1/4	....	....	....	10	....	....	....
Fig. 729. Black.....Each	15.50	27.50	40.00	40.00	40.00	66.00	66.00	66.00
Galvanized.....Each	27.00	46.75	68.00	68.00	68.00	112.00	112.00	112.00

The Inlets of 90° Y-Branches are tapped, pitched 1/4 inch to the foot.

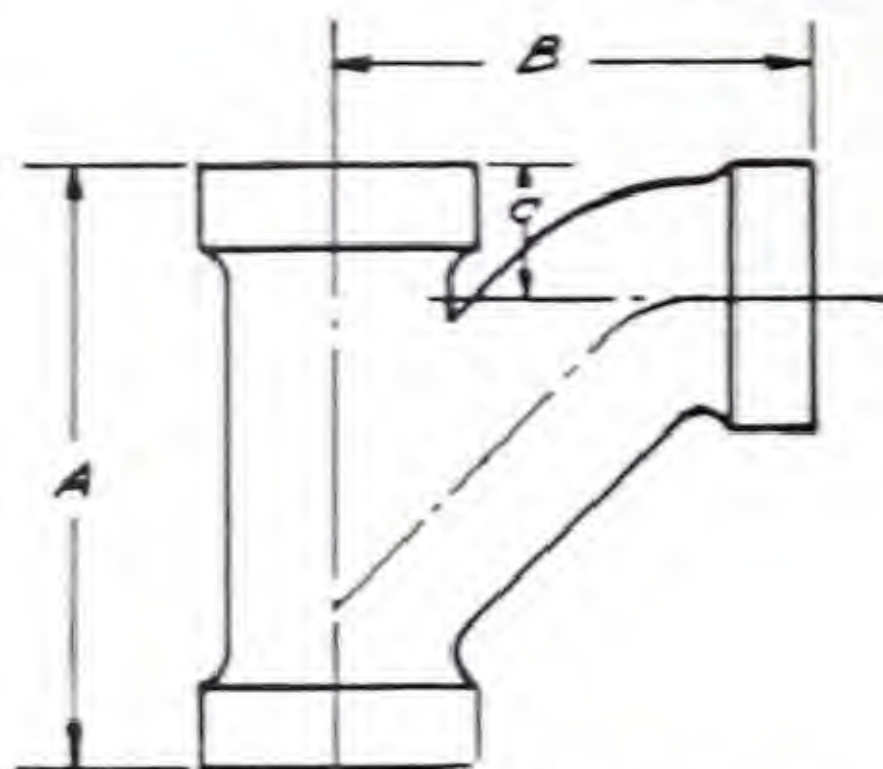
The Inlets of Reducing Fittings are always the smallest openings.

Dimensions subject to a slight variation and change without notice.

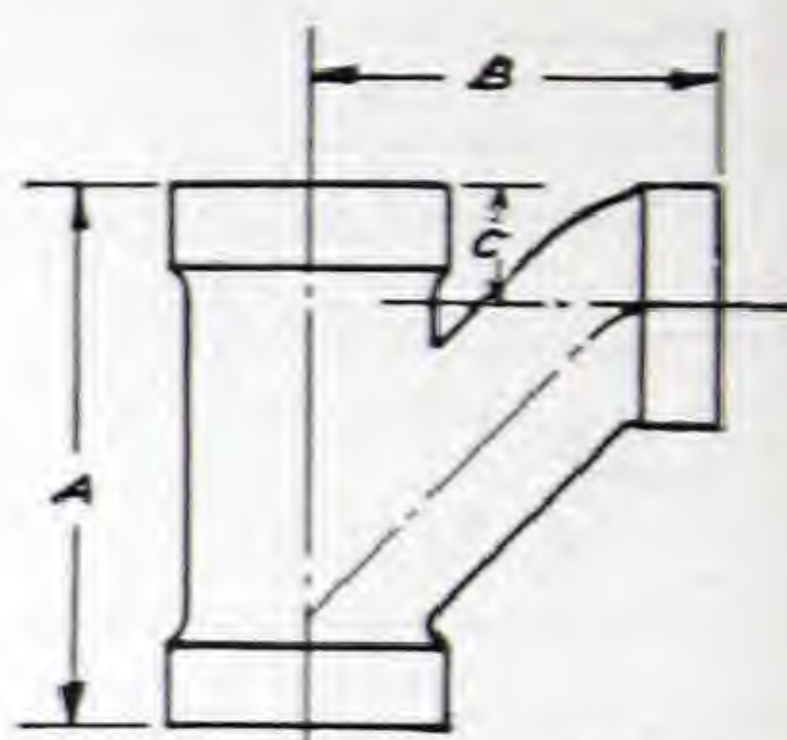
Order by Figure Number.

GRINNELL CAST IRON DRAINAGE FITTINGS

90° Long Turn Y-Branches



90° Long Turn Y-Branches
Tee Pattern—Fig. No. 730



Reducing 90° Long Turn Y-Branches
Tee Pattern—Fig. No. 731

90° LONG TURN Y-BRANCHES, TEE PATTERN—Fig. No. 730

Size.....Inches	1 1/4	1 1/2	2	2 1/2	3
Dimension A.....Inches	4 3/4	5 3/8	7 1/8	8 1/4	9 5/8
Dimension B.....Inches	3 5/8	4 1/8	5 1/8	6 1/4	7 1/2
Dimension C.....Inches	1 5/8	1 1/4	1 5/8	2	2 5/8
Fig. 730. Black.....Each	.57	.70	1.10	2.40	3.35
Galvanized.....Each	1.00	1.22	1.95	4.20	5.85

Size.....Inches	4	5	6	7	8	10
Dimension A.....Inches	13 3/4	15 3/4	18 1/2	21 5/8	24 3/8	..
Dimension B.....Inches	9 7/8	12 1/4	14 3/8	16 7/8	19 5/8	..
Dimension C.....Inches	2 7/8	3 1/2	4 1/8	4 3/4	5 1/4	..
Fig. 730. Black.....Each	6.00	9.50	20.00	30.00	40.00	55.00
Galvanized.....Each	10.50	16.50	35.00	52.50	70.00	90.00

REDUCING 90° LONG TURN Y-BRANCHES TEE PATTERN—Fig. No. 731

Size.....Inches	1 1/2 x 1 1/4	2 x 1 1/4	2 x 1 1/2	2 1/2 x 1 1/4	2 1/2 x 1 1/2	2 1/2 x 2	3 x 1 1/2	3 x 2	4 x 1 1/2
Dimension A.....Inches	5 1/8	....	5 3/4	....	5 3/4	7 3/8	5 5/8	7 3/8	6 1/2
Dimension B.....Inches	3 7/8	....	4 3/8	....	4 3/8	5 3/4	5	6 1/8	5 3/8
Dimension C.....Inches	1 5/8	....	1 5/8	....	1 5/8	1 5/8	1 5/8	1 5/8	1 5/8
Fig. 731. Black.....Each	.80	1.20	1.20	2.65	2.65	2.65	3.75	3.75	6.60
Galvanized.....Each	1.40	2.10	2.10	4.65	4.65	4.65	6.55	6.55	11.55

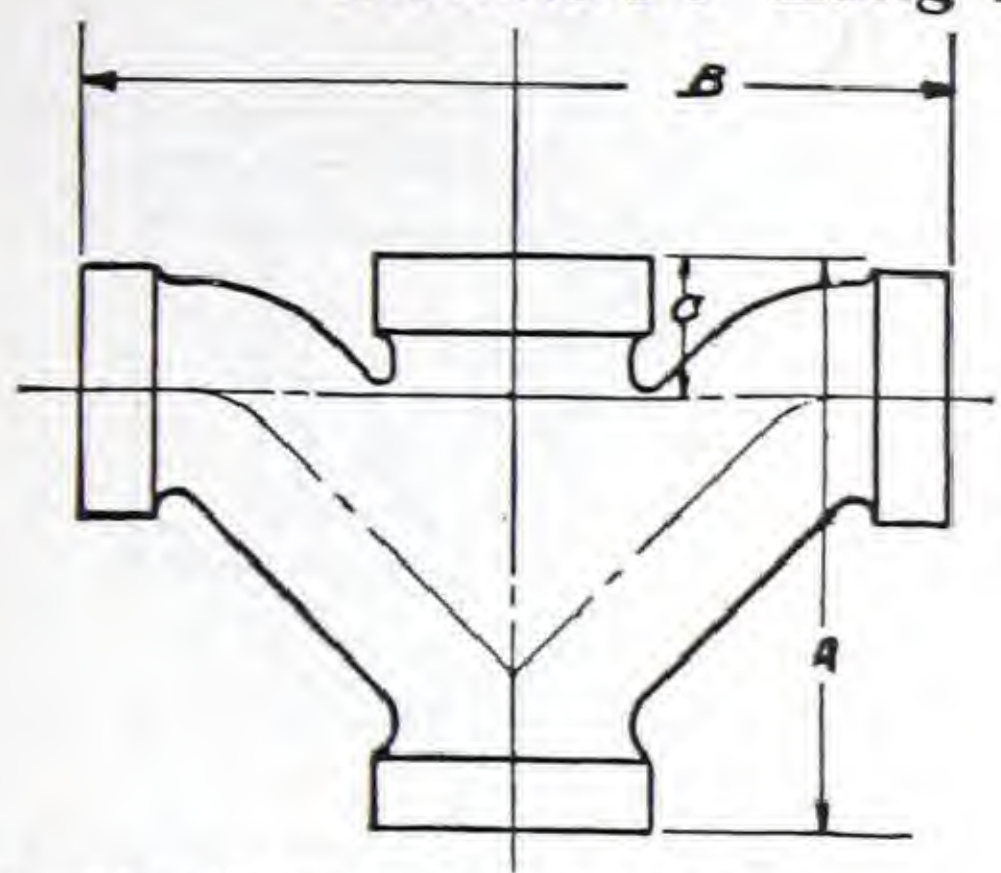
Size.....Inches	4 x 2	4 x 2 1/2	4 x 3	5 x 1 1/2	5 x 2	5 x 3	5 x 4	6 x 2	6 x 3
Dimension A.....Inches	7 1/8	8 5/8	10	6 3/8	7 3/4	10 1/4	13	7 5/8	10 3/8
Dimension B.....Inches	6 5/8	7 1/8	8 1/8	6	7 1/8	8 5/8	10 1/8	7 3/4	9 1/8
Dimension C.....Inches	1 5/8	2	2 3/8	1 3/8	1 5/8	2 3/8	2 7/8	1 5/8	2 5/8
Fig. 731. Black.....Each	6.60	6.60	6.60	10.50	10.50	10.50	10.50	22.00	22.00
Galvanized.....Each	11.55	11.55	11.55	18.50	18.50	18.50	18.50	38.50	38.50

Size.....Inches	6 x 4	6 x 5	7 x 3	7 x 4	8 x 3	8 x 4	10 x 4	10 x 6
Dimension A.....Inches	13 1/8	16 1/8	10 7/8	13 5/8	10 5/8	13 3/8	14	20 1/4
Dimension B.....Inches	11	12 3/8	9 5/8	11 5/8	10 1/4	12	13	17 1/4
Dimension C.....Inches	2 7/8	3 1/2	2 5/8	2 7/8	2 5/8	2 5/8	3	4 1/8
Fig. 731. Black.....Each	22.00	22.00	33.00	33.00	44.00	44.00	60.00	60.00
Galvanized.....Each	38.50	38.50	58.00	58.00	77.00	77.00	102.00	102.00

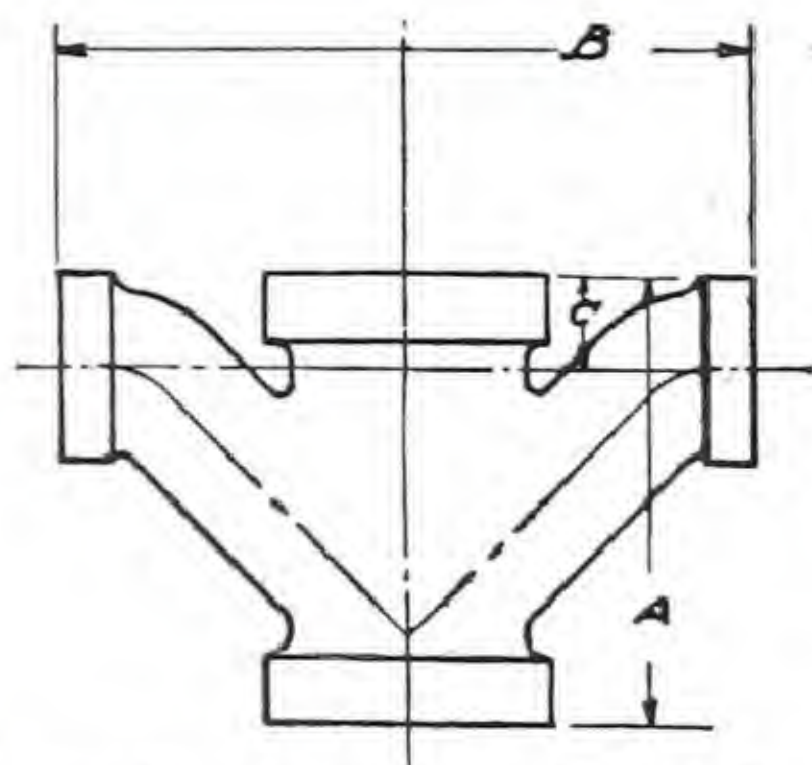
The Inlets of Long Turn 90° Y-Branches are tapped, pitched 1/4 inch to the foot.
The Inlets of Reducing Fittings are always the smallest openings.
Dimensions subject to a slight variation and change without notice.
Order by Figure Number.

GRINNELL CAST IRON DRAINAGE FITTINGS

Double 90° Long Turn Y-Branches



Double 90° Long Turn Y-Branches
Tee Pattern—Fig. No. 732



Reducing Double 90° Long Turn Y-Branches
Tee Pattern—Fig. No. 733

DOUBLE 90° LONG TURN Y-BRANCHES

TEE PATTERN—Fig. No. 732

Size.....Inches	1 1/4	1 1/2	2	2 1/2	3	4
Dimension A.....Inches	4 3/4	5 3/8	7 1/8	8 1/4	9 13/16	13 3/4
Dimension B.....Inches	7 1/4	8 1/4	10 7/8	12 1/2	15	19 3/4
Dimension C.....Inches	1 3/16	1 1/4	1 5/8	2	2 5/16	2 7/8
Fig. 732. Black.....Each	1.00	1.10	1.75	3.60	5.00	9.00
Galvanized...Each	1.75	1.95	3.10	6.30	8.75	15.75

Size.....Inches	5	6	7	8	10
Dimension A.....Inches	15 3/4	18 11/16	21 5/8	24 9/16	.....
Dimension B.....Inches	24 1/2	29 1/8	33 3/4	38 5/8	.....
Dimension C.....Inches	3 1/2	4 1/8	4 3/4	5 1/4	.....
Fig. 732. Black.....Each	14.00	30.00	45.00	60.00	70.00
Galvanized.....Each	24.50	52.50	79.00	105.00	119.00

REDUCING DOUBLE 90° LONG TURN Y-BRANCHES

TEE PATTERN—Fig. No. 733

Size.....Inches	1 1/2 x 1 1/4	2 x 1 1/4	2 x 1 1/2	2 1/2 x 1 1/4	2 1/2 x 1 1/2	2 1/2 x 2	3 x 1 1/2
Dimension A.....Inches	5 1/8	.....	5 3/4	.....	5 3/4	7 3/8	5 15/16
Dimension B.....Inches	7 3/4	.....	8 3/4	.....	9 1/8	11 1/2	10
Dimension C.....Inches	1 3/16	.....	1 5/16	.....	1 5/16	1 5/8	1 5/16
Fig. 733. Black.....Each	1.25	1.90	1.90	4.00	4.00	4.00	5.50
Galvanized...Each	2.25	3.35	3.35	7.00	7.00	7.00	9.65

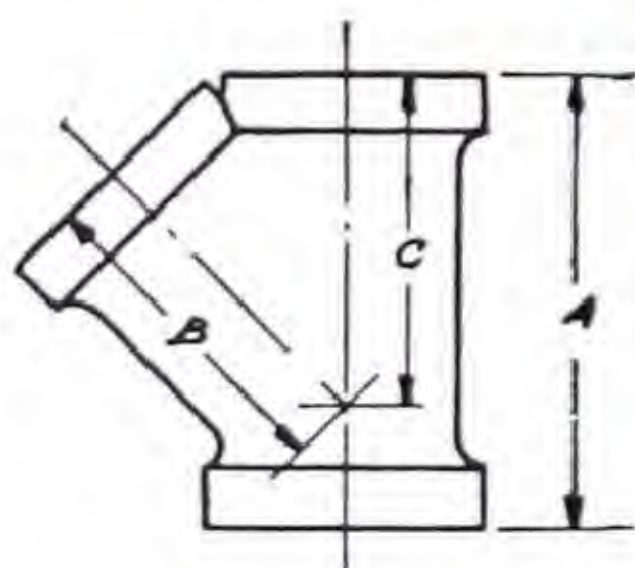
Size.....Inches	3x2	4x2	4x3	5x2	5x3	5x4
Dimension A.....Inches	7 9/16	7 11/16	10	7 3/4	10 1/4	13
Dimension B.....Inches	12 1/8	13 1/4	16 1/8	14 1/4	17 1/4	20 7/8
Dimension C.....Inches	1 5/8	1 5/8	2 3/8	1 5/8	2 3/8	2 7/8
Fig. 733. Black.....Each	5.50	10.00	10.00	15.50	15.50	15.50
Galvanized...Each	9.65	17.50	17.50	27.00	27.00	27.00

Size.....Inches	6x2	6x4	6x5	7x4	8x3	8x6
Dimension A.....Inches	7 15/16	13 1/16	16 1/16	.....	10 5/8	.....
Dimension B.....Inches	15 1/2	22	25 5/8	.....	20 1/2	.....
Dimension C.....Inches	1 5/8	2 7/8	3 1/2	.....	2 5/16	.....
Fig. 733. Black.....Each	33.00	33.00	33.00	50.00	66.00	66.00
Galvanized...Each	58.00	58.00	58.00	85.00	112.00	112.00

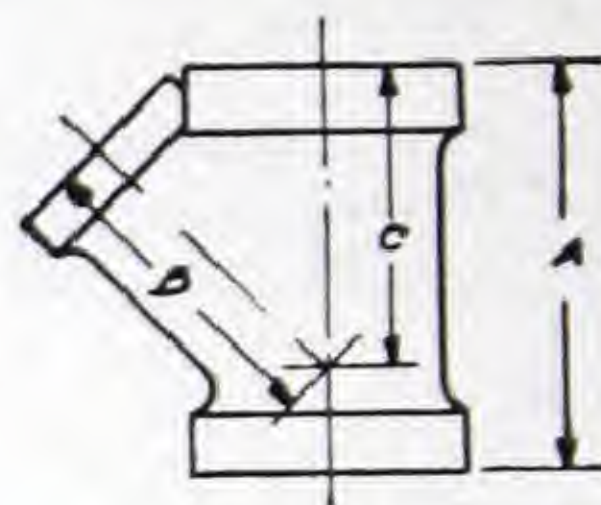
The Inlets of Double 90° Long Turn Y-Branches are tapped, pitched 1/4 inch to the foot.
The Inlets on Reducing Fittings are always the smallest openings.
Dimensions subject to a slight variation and change without notice.
Order by Figure Number.

GRINNELL CAST IRON DRAINAGE FITTINGS

45° Y-Branches



45° Y-Branches—Fig. No. 734



Reducing 45° Y-Branches—Fig. No. 735

45° Y-BRANCHES—Fig. No. 734

Size.....Inches	1¼	1½	2	2½	3	4
Dimension A.....Inches	5	5½	6 7/16	7 7/8	9	10 7/8
Dimension B.....Inches	3¼	3 5/8	4 5/16	5 3/8	6 3/8	7 11/16
Dimension C.....Inches	3¼	3 5/8	4 5/16	5 3/8	6 3/8	7 11/16
Fig. 734. Black.....Each	.52	.65	.95	2.10	2.65	3.85
Galvanized.....Each	.90	1.15	1.65	3.70	4.65	6.75

Size.....Inches	5	6	7	8	10
Dimension A.....Inches	12 13/16	14 3/4	16 11/16	18 13/16	22 1/4
Dimension B.....Inches	9 8/16	10 3/4	12 1/4	13 9/16	16 1/8
Dimension C.....Inches	9 8/16	10 3/4	12 1/4	13 9/16	16 1/8
Fig. 734. Black.....Each	7.10	10.50	19.00	25.00	52.00
Galvanized.....Each	12.50	18.50	33.25	44.00	91.00

REDUCING 45° Y-BRANCHES—Fig. No. 735

Size.....Inches	1½x1¼	2x1¼	2x1½	2½x1¼	2½x1½	2½x2	3x1½	3x2	3x2½
Dimension A....Inches	5	5 3/8	5 7/8	....	6 7/16	7 1/8	6 5/8	7 3/8	8
Dimension B....Inches	3 9/16	3 15/16	4 1/8	....	4 5/8	5 1/8	5 1/16	5 3/8	5 11/16
Dimension C....Inches	3 1/2	3 3/4	4 1/16	....	4 9/16	4 15/16	4 15/16	5 5/16	5 11/16
Fig. 735. Black..Each	.72	1.05	1.05	2.30	2.30	2.30	2.90	2.90	2.90
Galvanized..Each	1.25	1.85	1.85	4.00	4.00	4.00	5.10	5.10	5.10

Size.....Inches	4x1½	4x2	4x2½	4x3	5x2	5x3	5x4	6x2	6x3
Dimension A....Inches	7 3/16	7 11/16	....	9 1/4	8 1/4	9 13/16	11 3/8	8 7/16	10
Dimension B....Inches	6 1/16	6 5/16	....	7 3/16	7 3/16	7 7/8	8 1/2	8 1/16	8 3/4
Dimension C....Inches	5 3/4	6	....	6 7/8	6 7/8	7 5/8	8 7/16	7 9/16	8 5/16
Fig. 735. Black..Each	4.25	4.25	4.25	4.25	7.80	7.80	7.80	11.50	11.50
Galvanized..Each	7.40	7.40	7.40	7.40	13.65	13.65	13.65	20.00	20.00

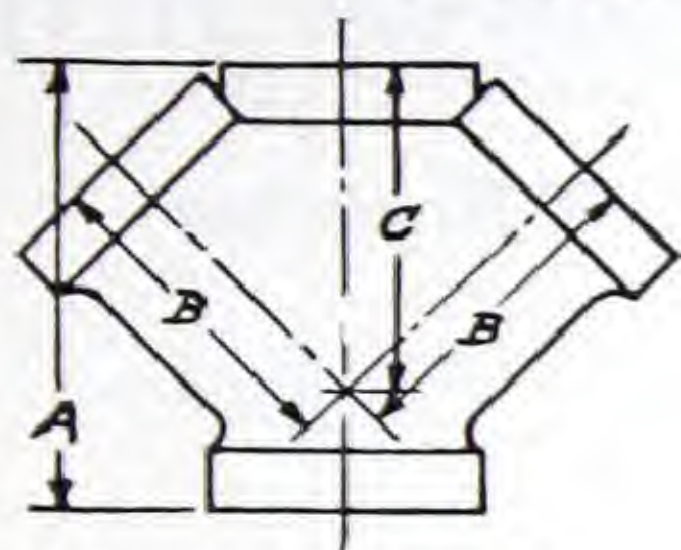
Size.....Inches	6x4	6x5	7x3	7x4	7x5	7x6	8x3
Dimension A....Inches	11 7/8	13	10	11 7/16	16 11/16	16 11/16	....
Dimension B....Inches	9 3/8	10	9 5/8	10 1/4	10 15/16	11 9/16	....
Dimension C....Inches	9 1/16	9 13/16	8 7/8	9 11/16	10 1/2	11 3/8	....
Fig. 735. Black..Each	11.50	11.50	21.00	21.00	21.00	21.00	27.50
Galvanized..Each	20.00	20.00	37.00	37.00	37.00	37.00	48.00

Size.....Inches	8x4	8x5	8x6	10x4	10x5	10x6
Dimension A....Inches	11 7/16	14 1/4	14 15/16	16	....	16
Dimension B....Inches	11	12	12 3/8	13 3/4	....	13 3/4
Dimension C....Inches	10 7/16	11 1/4	11 7/8	12 15/16	....	12 15/16
Fig. 735. Black..Each	27.50	27.50	27.50	57.00	57.00	57.00
Galvanized..Each	48.00	48.00	48.00	97.00	97.00	97.00

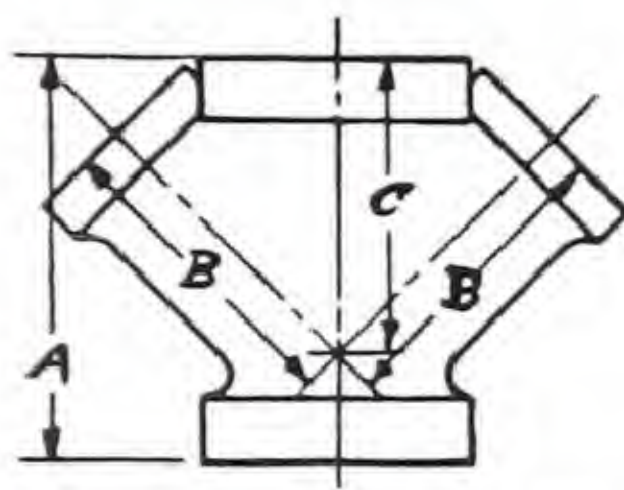
The Inlets on Reducing Fittings are always the smallest openings.
 Dimensions subject to a slight variation and change without notice.
 Order by Figure Number.

GRINNELL CAST IRON DRAINAGE FITTINGS

Double 45° Y-Branches



Double 45° Y-Branches
Fig. No. 736



Reducing Double 45° Y-Branches
Fig. No. 737

DOUBLE 45° Y-BRANCHES—Fig. No. 736

Size.....Inches	1 1/4	1 1/2	2	2 1/2	3	4
Dimension A.....Inches	5	5 1/2	6 7/16	7 7/8	9	10 7/8
Dimension B.....Inches	3 1/4	3 5/8	4 5/16	5 3/8	6 3/16	7 11/16
Dimension C.....Inches	3 1/4	3 5/8	4 5/16	5 3/8	6 3/16	7 11/16
Fig. 736. Black.....Each	.90	1.00	1.45	3.25	4.00	5.75
Galvanized.....Each	1.60	1.75	2.55	5.70	7.00	10.00

Size.....Inches	5	6	7	8	10
Dimension A.....Inches	12 15/16	14 3/4	16 11/16	18 13/16	22 1/4
Dimension B.....Inches	9 3/16	10 3/4	12 1/4	13 9/16	16 1/8
Dimension C.....Inches	9 3/16	10 3/4	12 1/4	13 9/16	16 1/8
Fig. 736. Black.....Each	10.75	16.00	28.50	38.00	78.00
Galvanized.....Each	18.80	28.00	50.00	66.50	137.00

REDUCING DOUBLE 45° Y-BRANCHES—Fig. No. 737

Size.....Inches	1 1/2 x 1 1/4	2 x 1 1/2	2 1/2 x 1 1/4	2 1/2 x 1 1/2	3 x 1 1/2
Dimension A.....Inches	.....	5 7/8	.....	6 7/16	6 5/8
Dimension B.....Inches	.....	4 1/8	.....	4 5/8	5 1/16
Dimension C.....Inches	.....	4 1/8	.....	4 9/16	4 15/16
Fig. 737. Black.....Each	1.10	1.60	3.60	3.60	4.40
Galvanized.....Each	1.90	2.80	6.30	6.30	7.70

Size.....Inches	3x2	4x2	4x3	5x2	5x3
Dimension A.....Inches	7 3/8	7 11/16	9 1/4	8 1/4	9 13/16
Dimension B.....Inches	5 3/8	6 5/16	7 3/16	7 3/16	7 7/8
Dimension C.....Inches	5 5/16	6	6 7/8	6 7/8	7 5/8
Fig. 737. Black.....Each	4.40	6.35	6.35	11.75	11.75
Galvanized.....Each	7.70	11.00	11.00	20.50	20.50

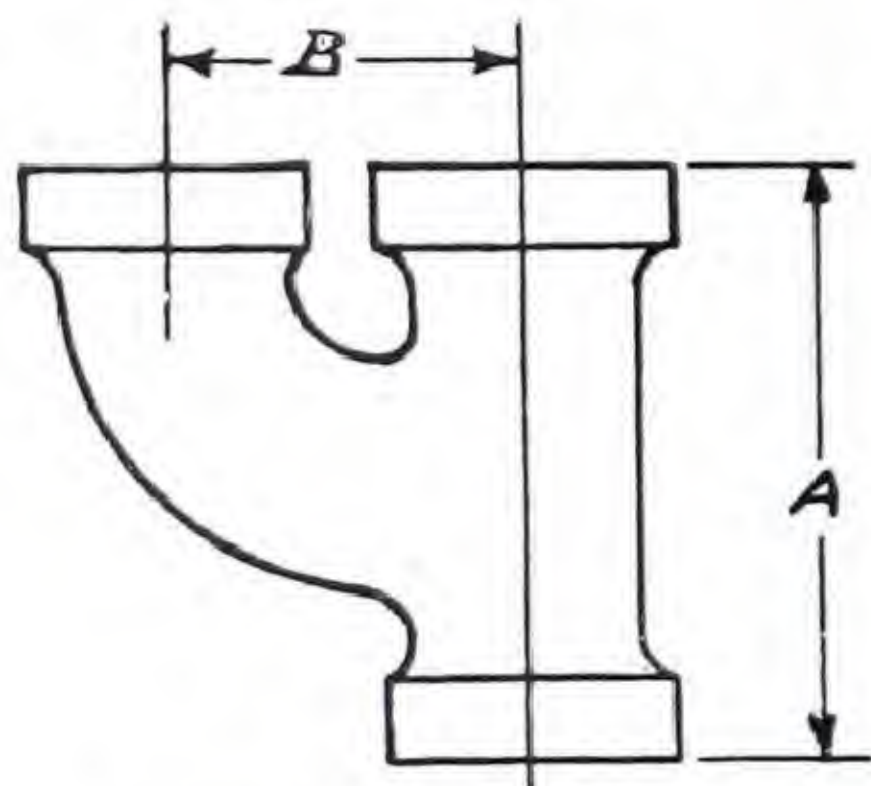
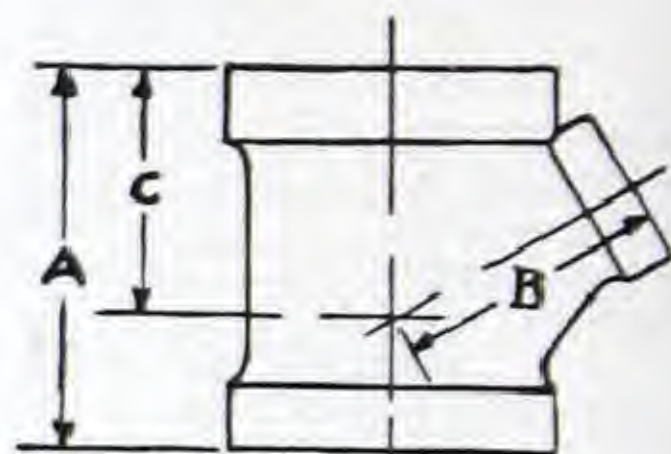
Size.....Inches	5x4	6x2	6x3	6x4	6x5
Dimension A.....Inches	11 3/8	8 7/16	10	11 7/8	13
Dimension B.....Inches	8 1/2	8 1/16	8 3/4	9 3/8	10
Dimension C.....Inches	8 7/16	7 9/16	8 5/16	9 1/16	9 13/16
Fig. 737. Black.....Each	11.75	17.50	17.50	17.50	17.50
Galvanized.....Each	20.50	30.50	30.50	30.50	30.50

Size.....Inches	7x6	8x4	8x5	8x6
Dimension A.....Inches	16 11/16	11 7/16	.....	14 15/16
Dimension B.....Inches	11 9/16	11	.....	12 3/8
Dimension C.....Inches	11 3/8	10 7/16	.....	11 7/8
Fig. 737. Black.....Each	31.50	42.00	42.00	42.00
Galvanized.....Each	54.00	72.00	72.00	72.00

The Inlets on Reducing Fittings are always the smallest openings.
Dimensions subject to a slight variation and change without notice.
Order by Figure Number.

GRINNELL CAST IRON DRAINAGE FITTINGS

Upright Y-Branches—60° Y-Branches

Special Upright Y-Branches
Fig. No. 73860° Y-Branches
Fig. No. 739

SPECIAL UPRIGHT Y-BRANCHES*—Fig. No. 738

Size.....Inches	1¼	1½	2
Dimension A.....Inches	5⅜	6	6⅝
Dimension B.....Inches	2⅜	3¼	4
Fig. 738. Black.....Each	Prices on Application		2.65
Galvanized.....Each			4.65

60° Y-BRANCHES—Fig. No. 739

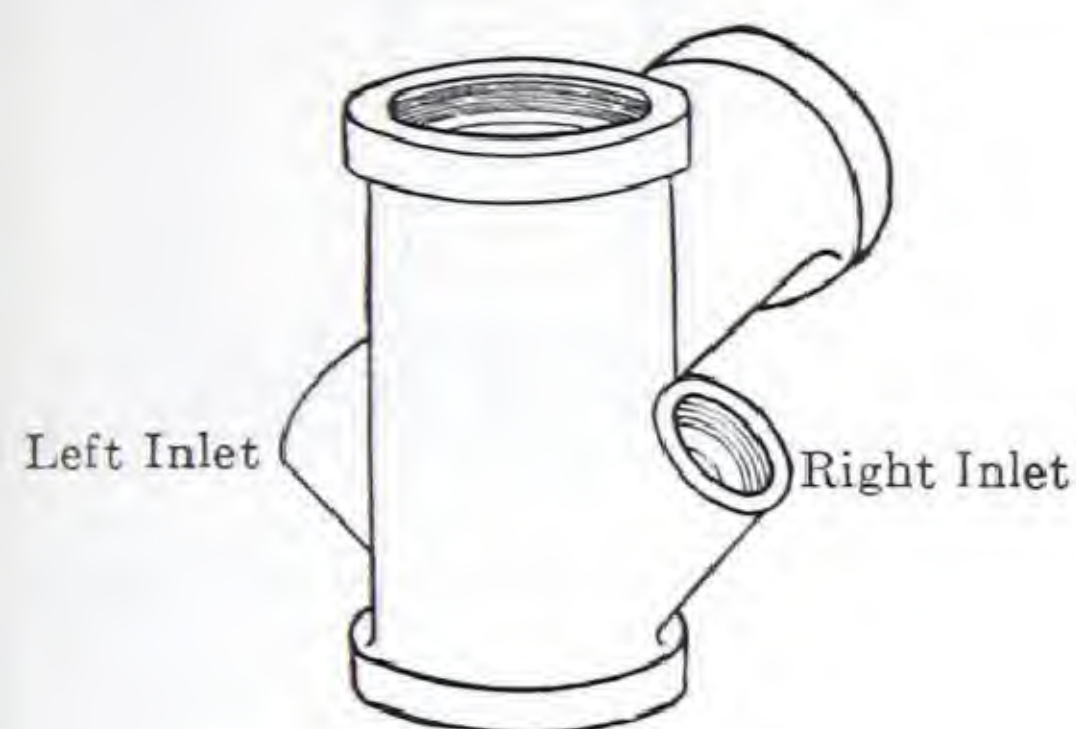
Size.....Inches	1¼	1½	2	2x1½	3	3x2
Dimension A.....Inches	...	4⅝	5½	4⅝	...	6⅞
Dimension B.....Inches	...	2⅝	3¼	3⅛	...	4⅛
Dimension C.....Inches	...	2⅝	3¼	2⅝	...	3⅝
Fig. 739. Black.....Each	.52	.65	.95	1.05	2.65	2.90
Galvanized.....Each	.90	1.15	1.65	1.85	4.65	5.10

Size.....Inches	4	4x2	4x3	5	5x3	6
Dimension A.....Inches	9⅜	6⅝	...	11⅞	8½	13
Dimension B.....Inches	5¾	4¾	...	6¾	6	7⅞
Dimension C.....Inches	5¾	4⅝	...	6¾	5⅝	7⅞
Fig. 739. Black.....Each	3.85	4.25	4.25	7.10	7.80	10.50
Galvanized.....Each	6.75	7.40	7.40	12.50	13.65	18.50

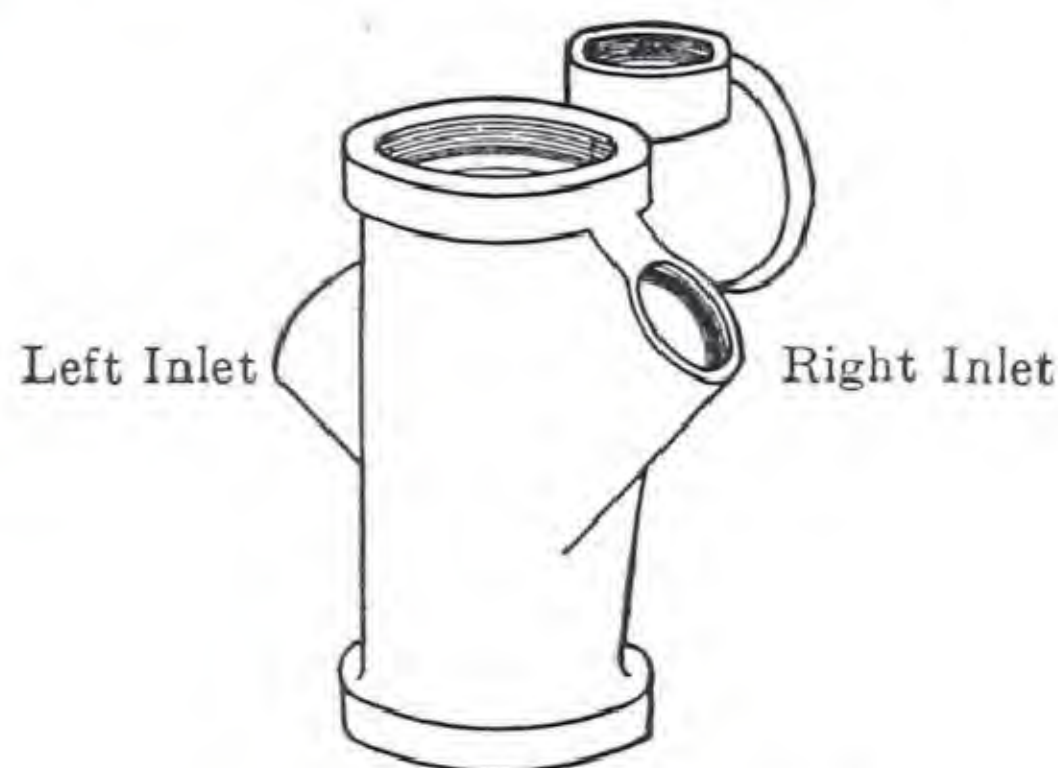
*Reducing sizes of Special Upright Y's carry same dimensions as straight sizes.
The Inlets on Reducing Fittings are always the smallest openings.
Dimensions subject to a slight variation and change without notice.
Order by Figure Number.

GRINNELL CAST IRON DRAINAGE FITTINGS

90° Y-Branches with Auxiliary Inlets
(Closet Tees)



With Side Inlets Only
Fig. No. 740



With Side and Top Inlets
Fig. No. 741

90° Y-BRANCHES WITH AUXILIARY INLETS—(Closet Tees)
Fig. Nos. 740, 741

Size	Inches	3	4	5x4	6x4
Fig. 740, with 2-inch Inlet. Right Side only. Black.....	Each	5.25	9.00	12.00	23.00
Fig. 740, with 2-inch Inlet. Right Side only. Galvanized	Each	9.20	15.75	21.00	40.00
Fig. 740, with 2-inch Inlet. Left Side only. Black.....	Each	5.25	9.00	12.00	23.00
Fig. 740, with 2-inch Inlet. Left Side only. Galvanized	Each	9.20	15.75	21.00	40.00
Fig. 740, with 2-inch Inlet. Both Sides. Black	Each	5.75	10.00	13.00	25.00
Fig. 740, with 2-inch Inlet. Both Sides. Galvanized.....	Each	10.00	17.50	22.75	44.00
Fig. 741, with 2-inch Inlet. Right Side and 2-inch Top Inlet. Black	Each	5.75	10.00	13.00	25.00
Fig. 741, with 2-inch Inlet. Right Side and 2-inch Top Inlet. Galvanized	Each	10.00	17.50	22.75	44.00
Fig. 741, with 2-inch Inlet. Left Side and 2-inch Top Inlet. Black.....	Each	5.75	10.00	13.00	25.00
Fig. 741, with 2-inch Inlet. Left Side and 2-inch Top Inlet. Galvanized.....	Each	10.00	17.50	22.75	44.00
Fig. 741, with 2-inch Inlet. Both Sides and 2-inch Top Inlet. Black.....	Each	6.50	11.00	14.50	28.00
Fig. 741, with 2-inch Inlet. Both Sides and 2-inch Top Inlet. Galvanized	Each	11.35	19.25	25.50	49.00

The 90° Inlets of Closet Tees are tapped, pitched $\frac{1}{4}$ inch to the foot.

The Inlets of Reducing Fittings are always the smallest openings.

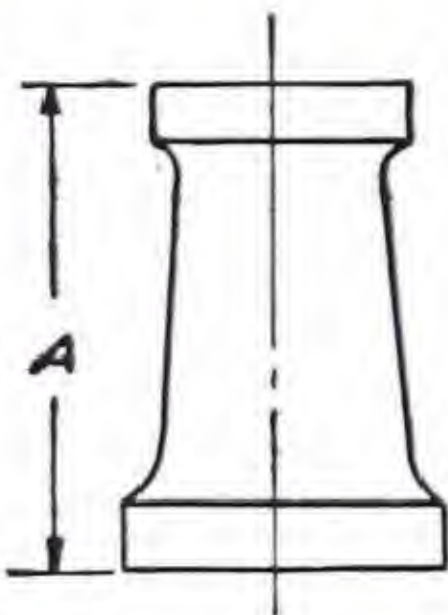
For dimensions covering the above Long Turn Fittings, see page 218.

We can furnish to order Fittings with Auxiliary Side Inlets only, made from Short Pattern.

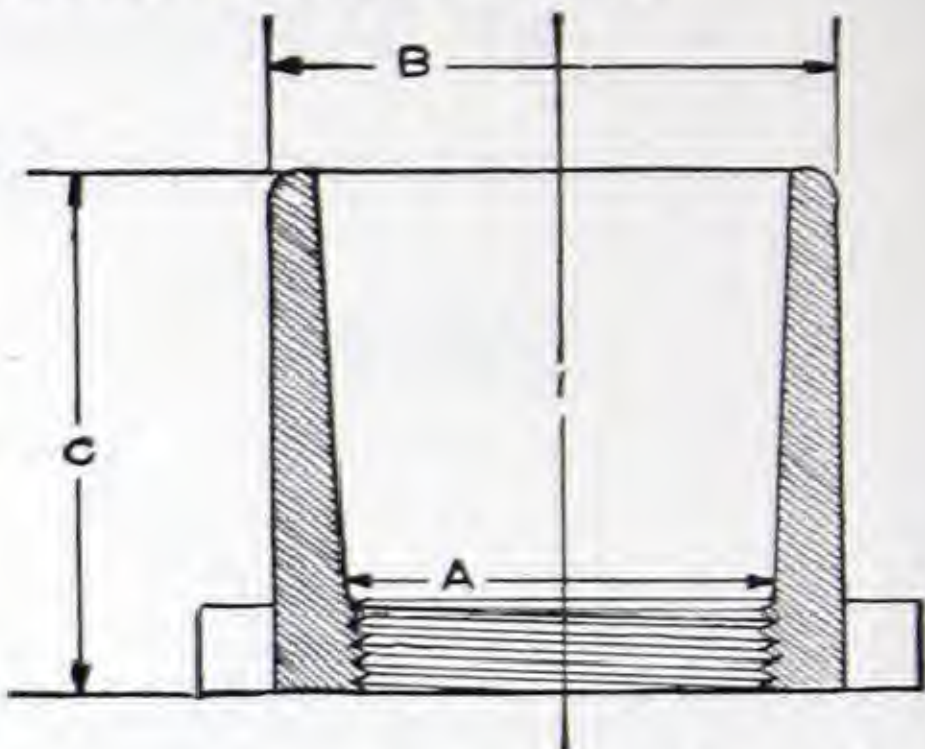
Inquiries or orders should give the above corresponding style numbers and specify Short Pattern.

For dimensions of Short Pattern Fittings, see page 216.

GRINNELL CAST IRON DRAINAGE FITTINGS
Increaseers—Roof and Tucker Connections



Increaseer—Fig. No. 742



Roof Connection—Fig. No. 743

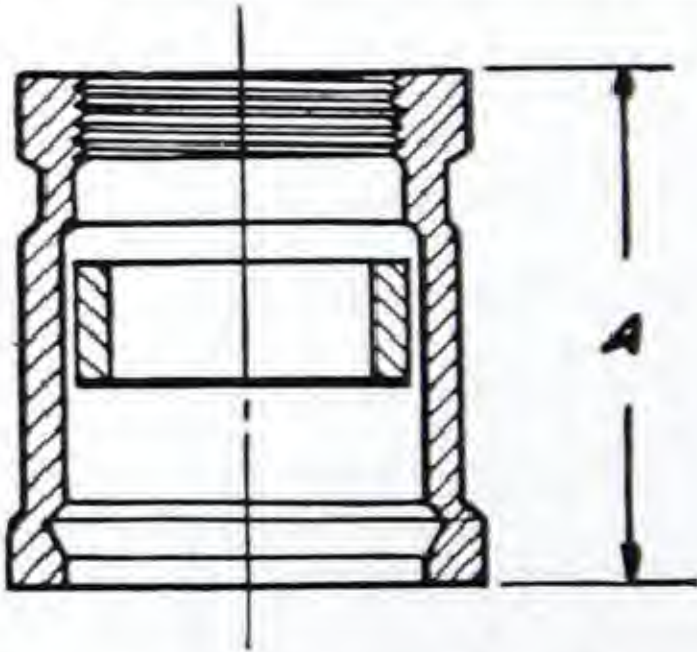
INCREASESERS—Fig. No. 742

Size.....Inches	3x2	4x2	4x3	5x2	5x3	5x4	6x4
Dimension A.....Inches	9	9	9	9	9	9	9
Fig. 742. Black.....Each	2.50	3.75	3.75	5.50	5.50	5.50	6.50
Galvanized, Each	4.40	6.55	6.55	9.65	9.65	9.65	11.35

Size.....Inches	6x5	7x4	7x6	8x4	8x6	10x8
Dimension A.....Inches	9	9	9	9	9	9
Fig. 742. Black.....Each	6.50	12.00	12.00	15.00	15.00	20.00
Galvanized, Each	11.35	20.00	20.00	26.25	26.25	35.00

ROOF CONNECTIONS—Fig. No. 743

Size	Inches	2	3	4	5	6
Dimension A.....Inches		2 5/8	4 1/8	5 1/8	6	7 1/8
Dimension B.....Inches		3 1/2	4 7/8	5 7/8	6 7/8	8
Dimension C.....Inches		3 3/4	4 1/2	5	5 1/2	6
Fig. 743. Black.....Each		1.15	1.20	1.50	2.00	4.25
Galvanized.....Each		2.00	2.10	2.60	3.50	7.40



Tucker Connection—Fig. No. 744

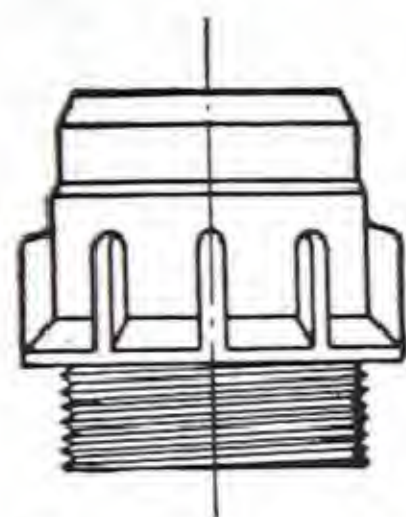
TUCKER CONNECTIONS—Fig. No. 744

Size.....Inches	2	3	4	5	6	7	8
Dimension A...Inches	4 1/2	4 3/4	6 3/4	7	7	8 3/8	8 1/2
Fig. 744. Black..Each	.80	2.00	3.25	6.00	8.75	17.50	21.00
Galvanized....Each	1.40	3.50	5.70	10.50	15.25	30.00	37.00

Dimensions subject to a slight variation and change without notice.
Order by Figure Number.

GRINNELL CAST IRON DRAINAGE FITTINGS

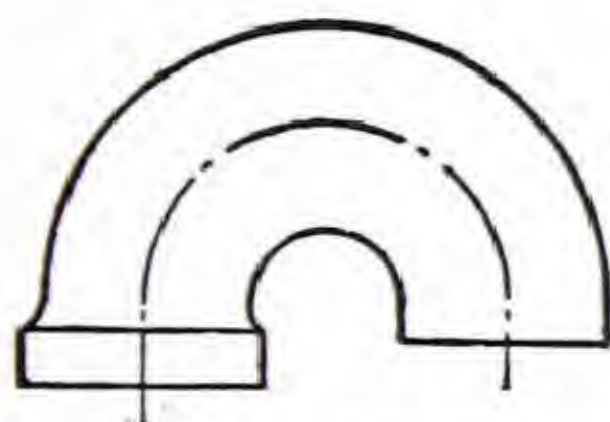
Soldering Nipples—Cappings—Offsets



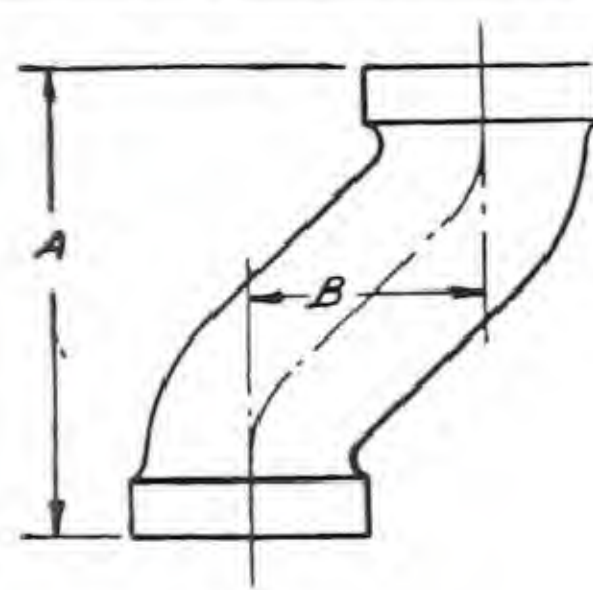
Soldering Nipples
Fig. No. 745

BRASS SOLDERING NIPPLES—Fig. No. 745

Size, .....Inches	1	1¼	1½	2	3	4	5
Fig. 745 .....Each	.80	.90	1.05	1.50	2.75	4.00	9.00



Cappings for Air Inlet Pipe
Fig. No. 746



Offsets
Fig. No. 747

CAPPINGS—Fig. No. 746

Size .....Inches	2	3	4	5
Fig. 746. Black.....Each	2.50	3.50	8.00	10.00
Galvanized.....Each	4.25	6.00	14.00	17.50

OFFSETS—Fig. No. 747

Size .....Inches	2	2	2	2	3	3	3
Offset B.....Inches	4	6	8	10	4	6	8
Length A.....Inches	7½	9½	11½	13½	8¾	10¾	12¾
Fig. 747. Black...Each	2.15	2.40	2.60	2.85	3.35	4.00	4.75
Galvanized .Each	3.75	4.20	4.55	5.00	5.85	7.00	8.30

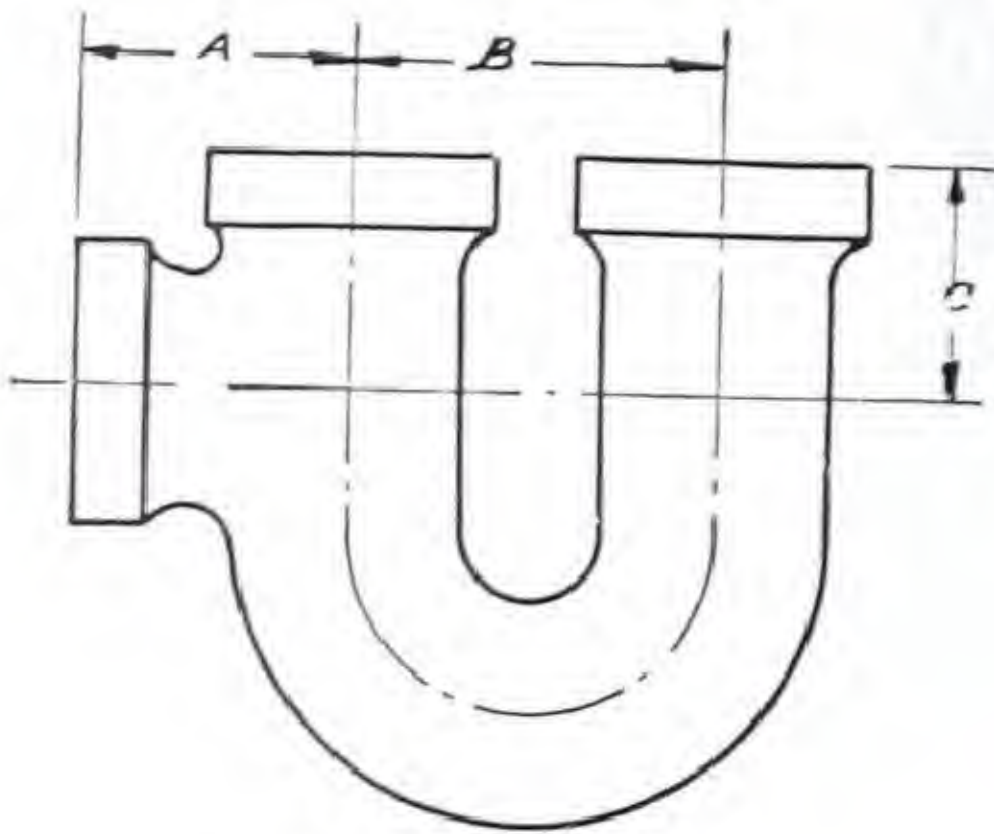
Size .....Inches	3	4	4	4	4	4	5
Offset B.....Inches	10	4	6	8	10	12	6
Length A. ....Inches	14¾	9¾	11¾	13¾	15¾	17¾	12⅝
Fig. 747. Black...Each	5.50	5.00	5.75	6.50	7.50	8.50	9.00
Galvanized .Each	9.65	8.75	10.00	11.35	13.15	15.00	15.75

Size .....Inches	5	5	5	6	6	6	6
Offset B.....Inches	8	10	12	6	8	10	12
Length A.....Inches	14⅝	16⅝	18⅝	13⅝	15⅝	17⅝	19⅝
Fig. 747. Black...Each	10.00	11.00	12.00	12.50	13.50	14.50	15.50
Galvanized .Each	17.50	19.25	21.00	22.00	23.50	25.50	27.00

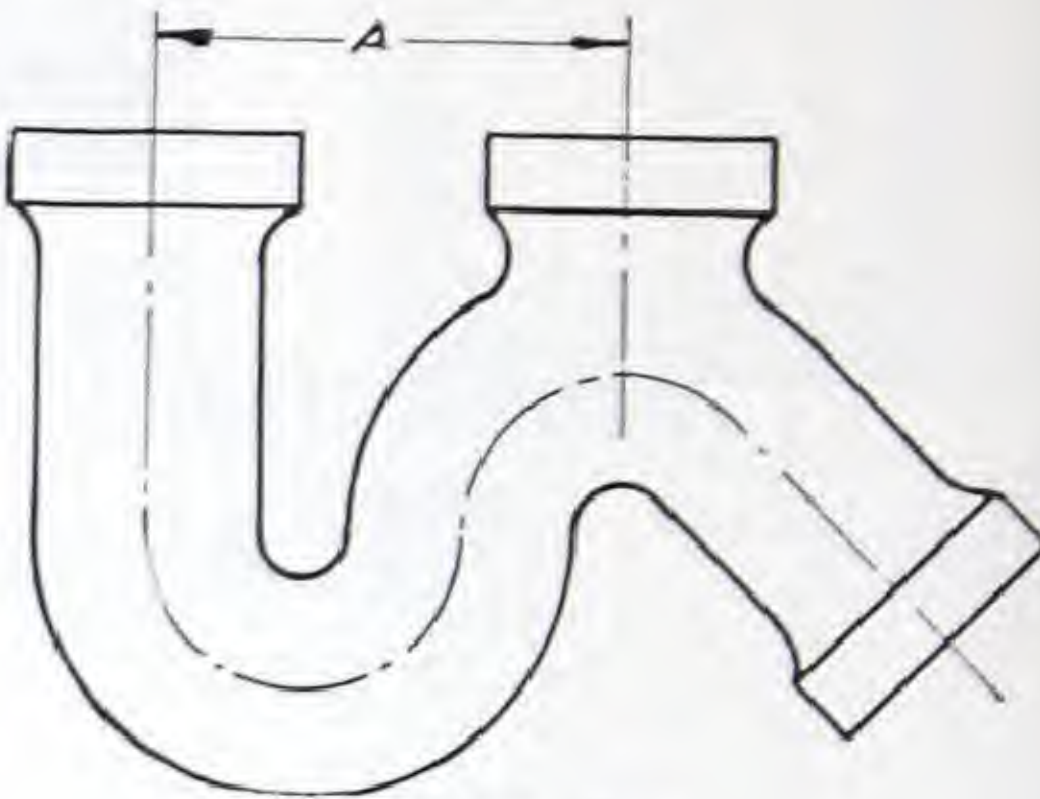
Dimensions subject to a slight variation and change without notice.
Order by Figure Number.

GRINNELL CAST IRON DRAINAGE FITTINGS

S-Traps



Half S-Traps
Fig. No. 748



Three-quarter S-Traps
Fig. No. 749

HALF S-TRAPS—Fig. No. 748

Size	Inches	1 1/4	1 1/2	2	3	4
Dimension A	Inches	2 1/8	2 3/8	3 1/2	4 3/8	5 1/8
Dimension B	Inches	2 3/4	3 1/2	4	5 3/8	7
Dimension C	Inches	2	2 3/16	2 9/16	3 1/2	4 3/16
Size of Vent	Inches	1 1/4	1 1/2	2	3	4
Fig. 748. Black.....	Each	1.50	1.70	2.20	5.00	10.00
Galvanized	Each	2.65	3.00	3.85	8.75	17.50

Size	Inches	5	6	7	8
Dimension A	Inches	6 1/16	6 9/16	7 3/4	8 5/16
Dimension B	Inches	8 3/8	10 1/8	11 1/4	12 3/8
Dimension C	Inches	4 3/4	5 7/16	6 1/8	6 3/4
Size of Vent	Inches	4	4	5	6
Fig. 748. Black.....	Each	21.50	32.50	40.00	55.00
Galvanized	Each	37.50	57.00	70.00	95.00

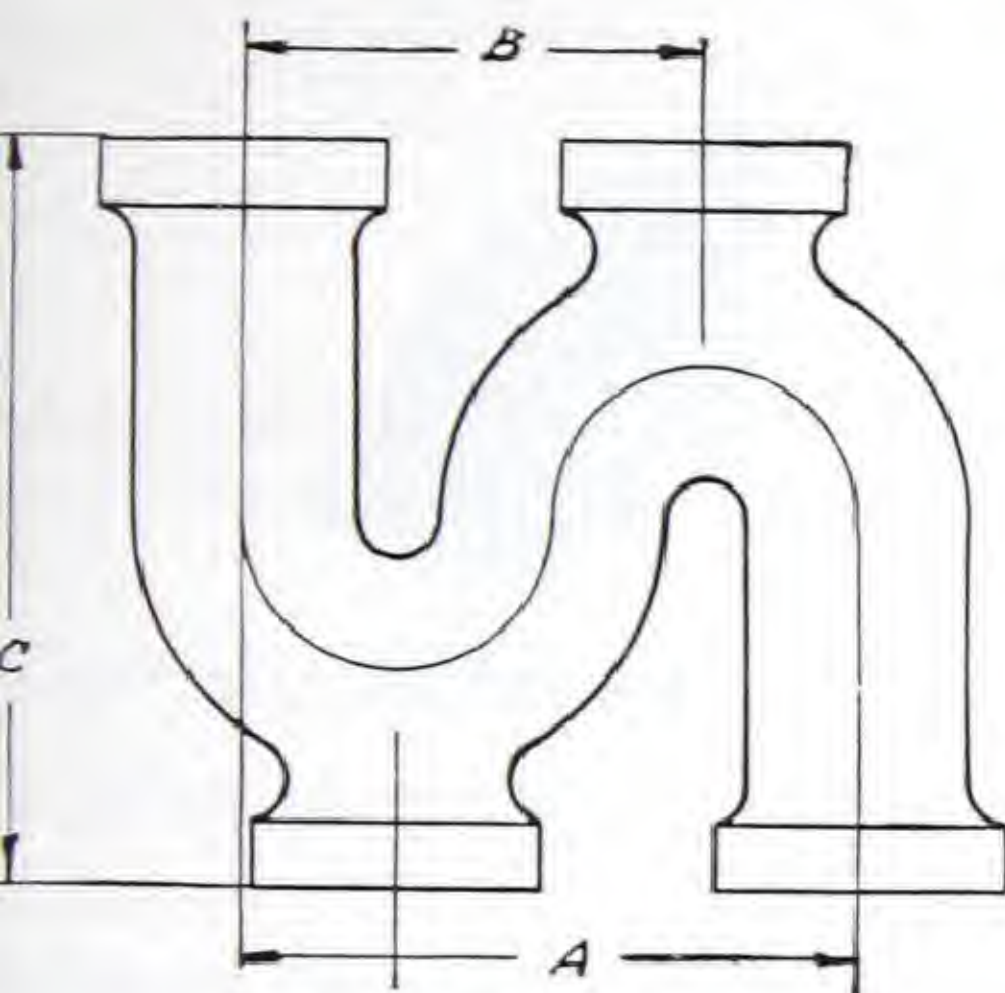
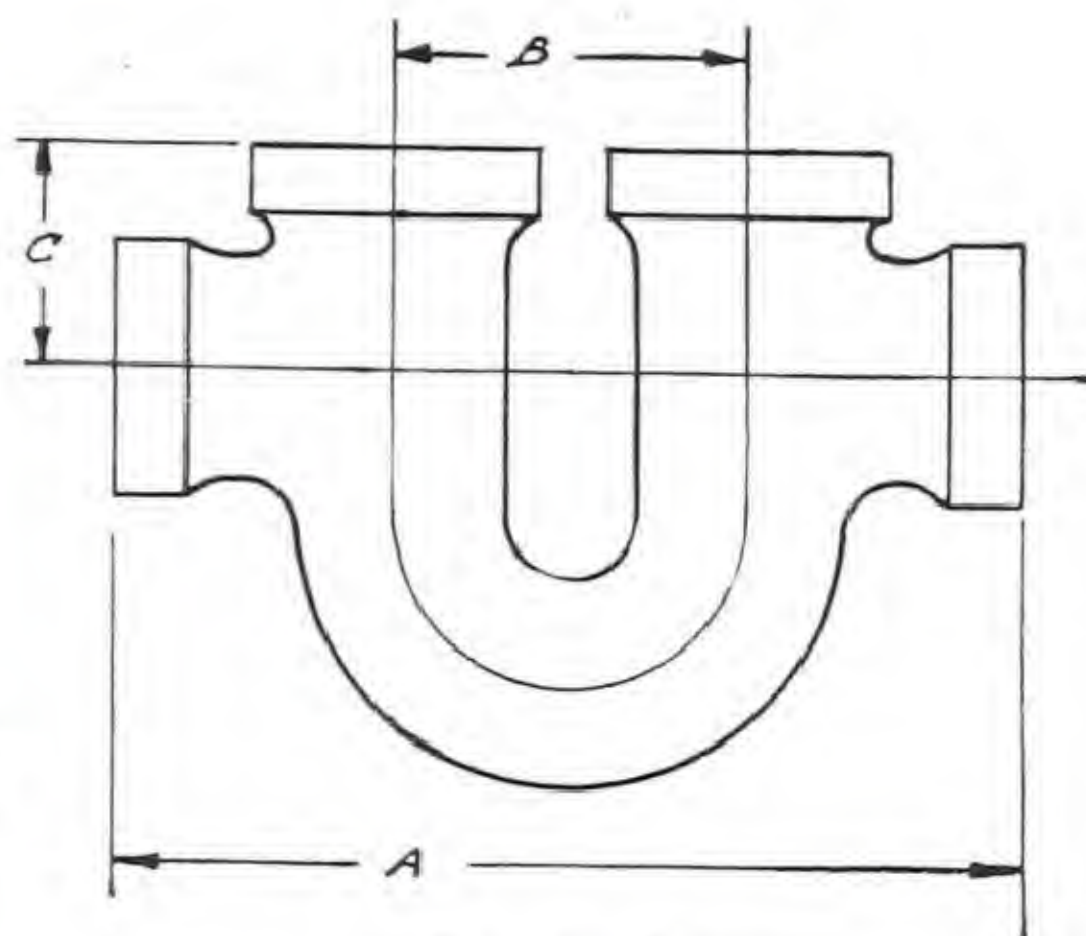
The Outlet of a Half S-Trap is tapped, pitched 1/4 inch to the foot.

THREE-QUARTER S-TRAPS—Fig. No. 749

Size	Inches	2	3	4	5	6	8
Dimension A	Inches	5 15/16	8 1/16	10 13/32	12 9/16	15 9/32	18 5/16
Size of Vent	Inches	2	3	4	4	4	4
Fig. 749. Black.....	Each	4.00	9.25	14.00	21.00	36.00	.....
Galvanizd	Each	7.00	16.00	24.00	37.00	63.00	.....

Above can be furnished with Cleanout when so ordered.
Dimensions subject to a slight variation and change without notice.

GRINNELL CAST IRON DRAINAGE FITTINGS

S-TrapsFull S-Traps
Fig. No. 750Running Traps
Fig. No. 751

FULL S-TRAPS—Fig. No. 750

Size.....Inches	1½	2	3	4	5	6	8
Dimension A...Inches	7½	7⅜	10⅜	14⅛	16⅜	20⅜	24⅜
Dimension B...Inches	5¼	5⅜	8⅜	10⅞	12⅞	15⅞	18⅞
Dimension C...Inches	7⅞	8	11¼	13¾	17⅞	21⅞	25⅞
Size of Vent....Inches	1½	2	3	4	4	4	4
Size of Cleanout Inches	1	1	1¼	2	2	2	2
Fig. 750, Black...Each	3.25	4.00	9.25	14.00	21.00	36.00	60.00
Galvanized....Each	5.75	7.00	16.00	24.00	37.00	63.00	105.00

RUNNING TRAPS—Fig. No. 751

Size.....Inches	1¼	1½	2	3	4	5	6	8
Dimension A....Inches	7	9¼	10⅞	13¾	17¼	20½	23¼	30¼
Dimension B....Inches	2¾	3½	4	5⅜	7	8⅜	10⅞	12⅜
Dimension C...Inches	2	2⅜	2⅞	3½	4⅜	4¾	5⅞	6¾
Size of Vent....Inches	1¼	1½	2	3	4	4	4	6
Fig. 751, Black...Each	2.40	2.70	3.30	5.50	9.75	24.50	33.50	65.00
Galvanized.....Each	4.20	4.70	5.75	9.50	17.00	43.00	58.50	115.00

Running Traps can be furnished with Cleanout when so ordered.

Inlet and Outlet of Running Traps are tapped, pitched ¼ inch to the foot.

Dimensions subject to a slight variation and change without notice.

STANDARD CAST IRON FLANGED FITTINGS

Explanatory Notes

All Standard Cast Iron Flanged Fittings are recommended for Steam Working Pressures up to 125 pounds and Water Working Pressures up to 175 pounds and are marked G-125.

All Standard Cast Iron Flanged Fittings and Flanges have plain faces.

Bolt holes are drilled $\frac{1}{8}$ inch larger in diameter than the diameter of bolts.

Bolt holes will not be spot faced unless so ordered, for which an extra charge will be made.

Bolt holes straddle the centre line. Square Head Bolts with hexagonal nuts are recommended.

For bolts $1\frac{5}{8}$ inches diameter and larger, studs with a nut on each end are satisfactory.

Hexagonal Nuts for pipe sizes 1 inch to 46 inches can be conveniently pulled up with open wrenches of minimum design of heads. Hexagonal Nuts for pipe sizes 48 inches to 100 inches on 125 pound fittings can be conveniently pulled up with box wrenches.

All Fittings and Flanges will be furnished with Flanges Faced and Drilled unless otherwise specified.

SWEEP FITTINGS

We call particular attention to the long easy radius of our standard flanged fittings. This naturally results in considerable less friction loss than is experienced when the ordinary square type of flanged fitting is used.

This fitting has been accepted and approved by engineers where double sweep pattern was specified and has proven absolutely satisfactory.

Our own Testing Department has proven that a medium radius fitting offers less frictional resistance than a fitting of lesser or greater radius.

STANDARD CAST IRON FLANGED FITTINGS

Elbows

125 Lbs. Steam Pressure

Elbow
Fig. No. 801

175 Lbs. Water Pressure

45° Elbow
Fig. No. 802

LIST PRICES

ELBOW—Fig. No. 801			45° ELBOW—Fig. No. 802		
Size Inches	With Flanges Faced	With Flanges Faced and Drilled	Size Inches	With Flanges Faced	With Flanges Faced and Drilled
1¼	\$3.00	\$3.60	1¼	\$3.30	\$3.90
1½	3.00	3.60	1½	3.30	3.90
2	3.00	3.60	2	3.30	3.90
2½	3.15	3.75	2½	3.50	4.10
3	3.45	4.15	3	3.80	4.50
3½	4.05	4.90	3½	4.50	5.35
4	4.50	5.50	4	5.00	6.00
4½	5.50	6.50	4½	6.00	7.00
5	6.25	7.25	5	6.90	7.90
6	7.60	8.90	6	8.35	9.65
7	10.50	12.00	7	11.00	12.50
8	12.00	13.60	8	12.60	14.20
9	17.00	19.25	9	17.75	20.00
10	19.00	21.70	10	20.00	22.70
12	28.00	31.00	12	29.50	32.50
14	41.50	45.25	14	41.50	45.25
15	47.00	51.50	15	47.00	51.50
16	54.50	59.50	16	54.50	59.50
18	71.00	77.00	18	71.00	77.00
20	90.00	97.00	20	90.00	97.00
22	113.00	122.00	22	113.00	122.00
24	140.00	150.00	24	140.00	150.00

For galvanized list prices, see page 239.

Order by Figure Number.

STANDARD CAST IRON FLANGED FITTINGS

Taper Reducing Elbows

125 Lbs. Steam Pressure

175 Lbs. Water Pressure

Taper Reducing Elbow
Fig. No. 803

LIST PRICES

Size Inches	With Flanges Faced	With Flanges Faced and Drilled	Size Inches	With Flanges Faced	With Flanges Faced and Drilled
2½x2	\$6.30	\$6.90	8x 5	\$24.00	\$25.60
3 x1½	6.90	7.60	8x 6	24.00	25.60
3 x2	6.90	7.60	8x 7	24.00	25.60
3 x2½	6.90	7.60	9x 6	34.00	36.25
3½x2	8.10	8.95	9x 8	34.00	36.25
3½x2½	8.10	8.95	10x 4½	38.00	40.70
3½x3	8.10	8.95	10x 5	38.00	40.70
4 x2	9.00	10.00	10x 6	38.00	40.70
4 x2½	9.00	10.00	10x 7	38.00	40.70
4 x3	9.00	10.00	10x 8	38.00	40.70
4 x3½	9.00	10.00	10x 9	38.00	40.70
4½x2½	11.00	12.00	12x 6	56.00	59.00
4½x3½	11.00	12.00	12x 7	56.00	59.00
4½x4	11.00	12.00	12x 8	56.00	59.00
5 x2½	12.50	13.50	12x10	56.00	59.00
5 x3	12.50	13.50	14x10	70.00	73.75
5 x4	12.50	13.50	14x12	70.00	73.75
6 x2½	15.25	16.55	15x10	80.00	84.50
6 x3	15.25	16.55	15x12	80.00	84.50
6 x3½	15.25	16.55	16x12	90.00	95.00
6 x4	15.25	16.55	16x14	90.00	95.00
6 x5	15.25	16.55	16x15	90.00	95.00
7 x5	21.00	22.50	18x15	105.00	111.00
7 x6	21.00	22.50	18x16	105.00	111.00
8 x3	24.00	25.60	20x14	120.00	127.00
8 x3½	24.00	25.60	20x16	120.00	127.00
8 x4	24.00	25.60	20x18	120.00	127.00

For galvanized list prices, see page 239.

Order by Figure Number.

STANDARD CAST IRON FLANGED FITTINGS

Long Radius Elbows

125 Lbs. Steam Pressure

175 Lbs. Water Pressure



Long Radius Elbow
Fig. No. 804

LIST PRICES

Size Inches	With Flanges Faced	With Flanges Faced and Drilled	Radius Inches
2	\$ 5.00	\$ 5.90	5 ¹ / ₄
2 ¹ / ₂	5.25	6.15	5 ⁵ / ₈
3	5.75	6.85	6 ¹ / ₄
3 ¹ / ₂	6.75	8.00	6 ⁷ / ₈
4	7.50	9.00	7 ³ / ₈
4 ¹ / ₂	9.25	10.75	7 ³ / ₄
5	10.50	12.00	8 ¹ / ₂
6	12.65	14.60	9 ⁵ / ₈
7	17.50	19.75	10 ⁷ / ₈
8	20.00	22.40	12
9	28.50	31.85	13
10	31.50	35.50	14 ¹ / ₈
12	46.50	51.00	16 ¹ / ₂
14	69.00	74.50	18 ⁷ / ₈
15	78.00	84.75	20
16	91.00	98.50	21 ¹ / ₄
18	118.00	127.00	23 ⁵ / ₈
20	150.00	160.00	26

For galvanized list prices, see page 239.

Order by Figure Number.

STANDARD CAST IRON FLANGED FITTINGS

Base Elbows

125 Lbs. Steam Pressure

175 Lbs. Water Pressure



Base Elbow
Fig. No. 805

LIST PRICES

Size Inches	Faced Except Base Flange Each	Faced and Drilled Except Base Flange Each	Facing and Drilling Base Flange Each
4	\$9.00	\$10.00	\$3.00
4½	11.00	12.00	3.00
5	12.50	13.50	3.50
6	15.25	16.55	3.50
7	21.00	22.50	3.50
8	24.00	25.60	5.00
9	34.00	36.25	5.00
10	38.00	40.70	5.00
12	56.00	59.00	7.50
14	70.00	73.75	7.50
15	80.00	84.50	7.50
16	90.00	95.00	7.50
18	105.00	111.00	12.00

For galvanized list prices, see page 239.

Order by Figure Number.

STANDARD CAST IRON FLANGED FITTINGS

Side Outlet Elbows—Double Branch Elbows

125 Lbs. Steam Pressure

Double Branch Elbow
Fig. No. 806

175 Lbs. Water Pressure

Double Branch Elbow, Reducing
Fig. No. 807Side Outlet Elbow
Fig. No. 808Side Outlet Elbow, Reducing
Fig. No. 809

LIST PRICES

Size Inches	DOUBLE BRANCH ELBOWS				SIDE OUTLET ELBOWS			
	Str. Fig. No. 806		Red. Fig. No. 807		Str. Fig. No. 808		Red. Fig. No. 809	
	Faced Each	Faced and Drilled Each	Faced Each	Faced and Drilled Each	Faced Each	Faced and Drilled Each	Faced Each	Faced and Drilled Each
4	\$28.50	\$30.00	\$31.50	\$33.00	\$26.50	\$28.00	\$29.50	\$31.00
5	36.00	37.50	39.50	41.00	28.50	30.00	31.50	33.00
6	38.00	40.00	42.00	44.00	33.00	35.00	36.00	38.00
7	42.75	45.00	47.75	50.00	40.25	42.50	44.75	47.00
8	47.50	50.00	52.50	55.00	47.50	50.00	52.50	55.00
10	66.00	70.00	73.50	77.50	76.00	80.00	84.00	88.00
12	90.50	95.00	100.50	105.00	100.50	105.00	110.50	115.00
14	119.50	125.00	132.50	138.00	129.50	135.00	144.50	150.00
16	142.50	150.00	157.50	165.00	152.50	160.00	167.50	175.00

When ordering either Side Outlet Elbows or Double Branch Elbows, please furnish sketch showing exact size of all openings. On Side Outlet Elbows state whether Side Outlet is to be on radial or intersecting lines.

Double Branch Elbows having two different sizes of branches or reducing on inlet are considered special and are made to order at special net prices.

Order by Figure Number.

STANDARD CAST IRON FLANGED FITTINGS

Tees

125 Lbs. Steam Pressure

175 Lbs. Water Pressure

Tee
Fig. No. 811Tees Reducing on Run or Outlet
Fig. No. 812

LIST PRICES

TEES, STRAIGHT—Fig. No. 811			TEES, REDUCING—Fig. No. 812		
Size Inches	With Flanges Faced	With Flanges Faced and Drilled	Size Inches	With Flanges Faced	With Flanges Faced and Drilled
1 1/4	\$4.35	\$5.25	1 1/2	\$5.00	\$5.90
1 1/2	4.35	5.25	2	5.00	5.90
2	4.35	5.25	2 1/2	5.25	6.15
2 1/2	4.55	5.45	3	5.75	6.85
3	5.00	6.10	3 1/2	6.75	8.00
3 1/2	5.85	7.10	4	7.50	9.00
4	6.50	8.00	4 1/2	9.25	10.75
4 1/2	8.00	9.50	5	10.50	12.00
5	9.10	10.60	6	12.65	14.60
6	11.00	12.95	7	17.50	19.75
7	15.25	17.50	8	20.00	22.40
8	17.40	19.80	9	28.50	31.85
9	24.65	28.00	10	31.50	35.50
10	27.50	31.50	12	46.50	51.00
12	40.50	45.00	14	69.00	74.50
14	60.00	65.50	15	78.00	84.75
15	68.00	74.75	16	91.00	98.50
16	79.00	86.50	18	118.00	127.00
18	103.00	112.00	20	150.00	160.00
20	130.00	140.00	22	189.00	202.00
22	164.00	177.00	24	233.00	248.00
24	203.00	218.00			

For galvanized list prices, see page 239.

See page 242 for advanced prices beyond regular list and discount on Reducing Flanged Tees not carried in stock.

For list of reducing sizes carried in stock, see pages 240 to 242.

Order by Figure Number.

STANDARD CAST IRON FLANGED FITTINGS

Side Outlet Tees—Single Sweep Tees

25 Lbs. Steam Pressure

175 Lbs. Water Pressure



Single Sweep Tee—Fig. No. 813



Single Sweep Tee, Reducing—Fig. No. 814



Side Outlet Tee—Fig. No. 817



Side Outlet Tee, Reducing—Fig. No. 818

Size Inches	SINGLE SWEEP TEES				SIDE OUTLET TEES			
	Str. Fig. No. 813		Red. Fig. No. 814		Str. Fig. No. 817		Red. Fig. No. 818	
	Faced Each	Faced and Drilled Each	Faced Each	Faced and Drilled Each	Faced Each	Faced and Drilled Each	Faced Each	Faced and Drilled Each
2	\$5.00	\$5.90	.....	.....	.....	.....	.....	.....
2½	5.25	6.15	\$6.00	\$6.90	.....	.....	.....	.....
3	5.75	6.85	6.60	7.70	.....	.....	.....	.....
3½	6.75	8.00	7.75	9.00	.....	.....	.....	.....
4	7.50	9.00	8.65	10.15	\$31.00	\$33.00	\$34.00	\$36.00
4½	9.25	10.75	10.60	12.10	.....	.....	.....	.....
5	10.50	12.00	12.00	13.50	35.00	37.00	39.00	41.00
6	12.65	14.60	14.50	16.45	42.25	45.00	47.25	50.00
7	17.50	19.75	20.00	22.25	49.50	52.50	55.00	58.00
8	20.00	22.40	23.00	25.40	56.75	60.00	62.75	66.00
9	28.50	31.85	32.75	36.10	.....	.....	.....	.....
10	31.50	35.50	36.00	40.00	84.50	90.00	94.50	100.00
12	46.50	51.00	53.50	58.00	114.00	120.00	126.00	132.00
14	69.00	74.50	79.00	84.50	142.50	150.00	157.50	165.00
15	78.00	84.75	90.00	96.75	.....	.....	.....	.....
16	91.00	98.50	105.00	112.50	170.00	180.00	190.00	200.00

See page 242 for advanced prices beyond regular list and discount on Reducing Single Sweep Tees not carried in stock.

For list of reducing sizes carried in stock, see pages 240 to 242.

When ordering side outlet fittings, please furnish sketch showing exact size of all outlets. Order by Figure Number.

STANDARD CAST IRON FLANGED FITTINGS

Crosses

125 Lbs. Steam Pressure

175 Lbs. Water Pressure



Cross—Fig. No. 821



Cross, Reducing—Fig. No. 822

CROSSES, STRAIGHT—Fig. No. 821			CROSSES, REDUCING—Fig. No. 822		
Size Inches	With Flanges Faced	With Flanges Faced and Drilled	Size Inches	With Flanges Faced	With Flanges Faced and Drilled
1¼	\$6.75	\$7.95	.....	.....	.....
1½	6.75	7.95	.....	.....	.....
2	6.75	7.95	2	\$7.75	\$8.95
2½	6.95	8.15	2½	8.00	9.20
3	7.65	9.05	3	8.75	10.15
3½	9.00	10.70	3½	10.35	12.05
4	10.00	12.00	4	11.50	13.50
4½	12.00	14.00	4½	13.75	15.75
5	13.75	15.75	5	15.75	17.75
6	16.75	19.25	6	19.25	21.75
7	23.00	26.00	7	26.50	29.50
8	26.50	29.75	8	30.50	33.75
9	37.50	42.00	9	43.00	47.50
10	42.00	47.50	10	48.00	53.50
12	61.50	67.50	12	71.00	77.00
14	91.00	98.50	14	105.00	112.50
15	103.00	112.00	15	118.00	127.00
16	120.00	130.00	16	138.00	148.00
18	157.00	169.00	18	180.00	192.00
20	198.00	212.00	20	228.00	242.00
22	248.00	266.00	22	285.00	303.00
24	310.00	330.00	24	355.00	375.00

For galvanized list prices, see page 239.

See page 242 for advanced prices beyond regular list and discount on Reducing Flanged Crosses not carried in stock.

For list of reducing sizes carried in stock, see pages 240 to 242.

Order by Figure Number.

STANDARD CAST IRON FLANGED FITTINGS

Laterals

125 Lbs. Steam Pressure

175 Lbs. Water Pressure



Lateral—Fig. No. 823



Lateral, Reducing—Fig. No. 824

LATERAL, STRAIGHT—Fig. No. 823

LATERAL, REDUCING—Fig. No. 824

Size Inches	With Flanges Faced	With Flanges Faced and Drilled	Size Inches	With Flanges Faced	With Flanges Faced and Drilled
2	\$6.75	\$7.95	2	\$7.75	\$8.95
2½	6.95	8.15	2½	8.00	9.20
3	7.65	9.05	3	8.75	10.15
3½	9.00	10.70	3½	10.35	12.05
4	10.00	12.00	4	11.50	13.50
4½	12.00	14.00	4½	13.75	15.75
5	13.75	15.75	5	15.75	17.75
6	16.75	19.25	6	19.25	21.75
7	23.00	26.00	7	26.50	29.50
8	26.50	29.75	8	30.50	33.75
9	37.50	42.00	9	43.00	47.50
10	42.00	47.50	10	48.00	53.50
12	61.50	67.50	12	71.00	77.00
14	91.00	98.50	14	105.00	112.50
15	103.00	112.00	15	118.00	127.00
16	120.00	130.00	16	138.00	148.00
18	157.00	169.00	18	180.00	192.00
20	198.00	212.00	20	228.00	242.00
22	248.00	266.00	22	285.00	303.00
24	310.00	330.00	24	355.00	375.00

For galvanized list prices, see page 239.

See page 242 for advanced prices beyond regular list and discount on Reducing Flanged Laterals not carried in stock.

For list of reducing sizes carried in stock, see pages 240 to 242.

Order by Figure Number.

STANDARD CAST IRON FLANGED FITTINGS
Reducers

125 Lbs. Steam Pressure

Taper Reducer
Fig. No. 825

175 Lbs. Water Pressure

Eccentric Reducer
Fig. No. 826

Price on Application

LIST PRICES—Fig. No. 825

Size	With Flanges Faced	With Flanges Faced and Drilled	Size	With Flanges Faced	With Flanges Faced and Drilled
2½ x 2	\$6.90	\$7.60	10 x 4½	\$38.00	\$40.70
3 x 2	6.90	7.60	10 x 5	38.00	40.70
3½ x 2½	8.10	8.95	10 x 6	38.00	40.70
3½ x 3	8.10	8.95	10 x 8	38.00	40.70
4 x 2	9.00	10.00	12 x 5	56.00	59.00
4 x 2½	9.00	10.00	12 x 6	56.00	59.00
4 x 3	9.00	10.00	12 x 8	56.00	59.00
4 x 3½	9.00	10.00	12 x 10	56.00	59.00
4½ x 2	11.00	12.00	14 x 6	70.00	73.75
4½ x 2½	11.00	12.00	14 x 8	70.00	73.75
4½ x 3	11.00	12.00	14 x 10	70.00	73.75
4½ x 3½	11.00	12.00	14 x 12	70.00	73.75
4½ x 4	11.00	12.00	15 x 6	80.00	84.50
5 x 2	12.50	13.50	15 x 8	80.00	84.50
5 x 2½	12.50	13.50	15 x 10	80.00	84.50
5 x 3	12.50	13.50	15 x 12	80.00	84.50
5 x 3½	12.50	13.50	15 x 14	80.00	84.50
5 x 4	12.50	13.50	16 x 8	90.00	95.00
5 x 4½	12.50	13.50	16 x 10	90.00	95.00
6 x 3	15.25	16.55	16 x 12	90.00	95.00
6 x 3½	15.25	16.55	16 x 14	90.00	95.00
6 x 4	15.25	16.55	16 x 15	90.00	95.00
6 x 4½	15.25	16.55	18 x 10	105.00	111.00
6 x 5	15.25	16.55	18 x 12	105.00	111.00
7 x 3	21.00	22.50	18 x 14	105.00	111.00
7 x 3½	21.00	22.50	18 x 16	105.00	111.00
7 x 4	21.00	22.50	20 x 12	120.00	127.00
7 x 4½	21.00	22.50	20 x 14	120.00	127.00
7 x 5	21.00	22.50	20 x 16	120.00	127.00
7 x 6	21.00	22.50	20 x 18	120.00	127.00
8 x 3	24.00	25.60	22 x 14	150.00	159.00
8 x 3½	24.00	25.60	22 x 16	150.00	159.00
8 x 4	24.00	25.60	22 x 18	150.00	159.00
8 x 4½	24.00	25.60	22 x 20	150.00	159.00
8 x 5	24.00	25.60	24 x 16	190.00	200.00
8 x 6	24.00	25.60	24 x 18	190.00	200.00
8 x 7	24.00	25.60	24 x 20	190.00	200.00
10 x 4	38.00	40.70	24 x 22	190.00	200.00

For galvanized list prices, see page 239.

Order by Figure Number.

STANDARD FLANGED FITTINGS AND FLANGES

Extra Price for Galvanizing

LIST PRICE FOR GALVANIZING ONLY

Size Inches	Elbows Red. Elbows 45° Elbows Taper Reducers Each Extra	Tees and Reducing Tees Base Elbows Long Radius Elbows Each Extra	Crosses and Reducing Crosses Laterals and Reducing Laterals Each Extra	Companion Flanges Each Extra	Reducing Companion Flanges Solid Flanges Each Extra
1	...	.....	.....	\$0.60	\$0.90
1¼	\$2.40	\$3.60	\$4.80	.60	.90
1½	2.40	3.60	4.80	.60	.90
2	2.40	3.60	4.80	.70	1.00
2½	2.50	3.75	5.00	.75	1.10
3	2.75	4.15	5.50	.85	1.25
3½	3.25	4.90	6.50	1.00	1.50
4	3.65	5.50	7.25	1.20	1.80
4½	4.35	6.50	8.75	1.25	1.90
5	4.85	7.25	9.75	1.35	2.00
6	6.00	9.00	12.00	1.65	2.50
7	8.00	12.00	16.00	2.15	3.25
8	9.00	13.50	18.00	2.50	3.75
9	13.00	19.50	26.00	3.00	4.50
10	14.50	22.00	29.00	3.75	5.75
12	21.00	31.00	42.00	5.00	7.50
14	30.00	45.00	60.00	7.00	10.50
15	35.00	52.50	70.00	9.00	13.50
16	40.00	60.00	80.00	10.50	16.00

STANDARD REDUCING FLANGED FITTINGS



Showing Reducing Flange Bolted On

It is not possible to carry in stock at all times a line of Reducing Flanged Fittings complete and large enough to meet all demands of the trade promptly. It is our policy, however, to carry a complete line of Straight Sizes and an Extensive Line of Reducing Flanged Fittings in the sizes most called for, as given on the following pages.

To avoid delay in shipment, where other than sizes given on the following pages are ordered, we carry in stock a complete line of Reducing Flanges as given on page 321. The use of these Flanges in connection with straight or reducing fittings carried in stock, enable us to promptly fill orders for reducing sizes where specification will permit of reduction being made in this manner.

Customers who desire fittings reduced in this manner will please specify "Reduce By Flanges If Necessary." The Reducing Flanges furnished are the same thickness as the regular companion flange of the corresponding outside diameter and will be drilled to the template corresponding to the outside diameter unless otherwise ordered.

To order Reducing Companion Flanges, specify screwed or reduced size first, then the outside diameter of flange wanted: for instance if a reducing flange is required to connect a 4 inch pipe to a 9 inch flanged valve or fitting having a 15 inch O.D. Flange,

ORDER A 4" x 15" REDUCING FLANGE

This will avoid error and the confusion which is so often caused by incorrectly calling for a 9 x 4 or 4 x 9 Flange.

LIST OF SIZES

Standard Cast Iron Reducing Flanged Fittings

REDUCING FLANGED TEES—Fig. No. 812

2 x2 x1½	5x5 x4	7x7 x6	8x 3x8	12x12x9
2½x2½x2	5x5 x3½	7x7 x5	7x 7x8	12x12x8
2½x2½x1½	5x5 x3	7x7 x4	6x 6x8	12x12x7
2½x2 x1½	5x5 x2½	7x7 x3½	5x 5x8	12x12x6
3 x3 x2½	5x5 x2	7x7 x3		12x12x5
3 x3 x2	5x5 x1½	7x7 x2½	9x 9x8	12x12x4½
3 x3 x1½	5x5 x1¼	7x7 x2	9x 9x7	12x12x4
3 x3 x1¼	5x4 x5	7x6 x7	9x 9x6	12x12x3
3 x3 x1	5x4 x4	7x6 x6	9x 9x5	12x12x2
3 x2½x3	5x4 x3	7x6 x5	9x 9x4	12x10x12
3 x2½x2½	5x4 x2½	7x5 x7	9x 9x3	12x10x10
3 x2½x2	5x4 x2	7x5 x5	9x 9x2½	12x10x8
3 x2 x3	5x3½x4	7x4 x7	9x 6x6	12x10x6
3 x2 x2½	5x3 x5	7x3 x7		12x 8x12
3 x2 x2	5x3 x3½	6x6 x7		12x 8x10
2½x2½x3	5x3 x3	5x5 x7		12x 8x8
3½x3½x3	5x2½x5		10x10x9	12x 8x6
3½x3½x2½	5x2 x5		10x10x8	12x 6x12
3½x3½x2	4x4 x5		10x10x7	12x 6x8
3½x2½x2½			10x10x6	12x 4x12
4 x4 x3½	6x6 x5	8x8 x7	10x10x5	10x10x12
4 x4 x3	6x6 x4½	8x8 x6	10x10x4½	8x 8x12
4 x4 x2½	6x6 x4	8x8 x5	10x10x4	
4 x4 x2	6x6 x3½	8x8 x4½	10x10x3½	
4 x4 x1½	6x6 x3	8x8 x4	10x10x3	14x14x12
4 x4 x1¼	6x6 x2½	8x8 x3½	10x10x2½	14x14x10
4 x3½x4	6x6 x2	8x8 x3	10x10x2	14x14x9
4 x3 x4	6x6 x1½	8x8 x2½	10x 8x10	14x14x8
4 x3 x3	6x5 x6	8x8 x2	10x 8x8	14x14x7
4 x3 x2½	6x5 x5	8x7 x8	10x 8x7	14x14x6
4 x3 x2	6x5 x4	8x7 x7	10x 8x6	14x14x5
4 x2½x4	6x5 x3	8x7 x6	10x 8x5	14x14x4
4 x2½x3	6x5 x2½	8x7 x5	10x 8x4	14x12x14
4 x2½x2½	6x4 x6	8x7 x4	10x 7x10	14x12x12
4 x2 x4	6x4 x5	8x6 x8	10x 7x7	14x10x10
4 x2 x2	6x4 x4	8x6 x6	10x 6x10	10x10x14
3 x3 x4	6x4 x3	8x6 x5	10x 6x8	
2½x2½x4	6x4 x2½	8x6 x4	10x 6x6	
4½x4½x4	6x3 x6	8x6 x3	10x 5x10	16x16x14
4½x4½x3	6x3 x4	8x5 x8	10x 4x10	16x16x12
4½x4½x2½	6x3 x3	8x5 x7	10x 3x10	16x16x10
	6x2½x6	8x5 x6	8x 8x10	16x16x 8
	6x2 x6	8x5 x5	8x 6x10	16x16x 7
	5x5 x6	8x4 x8	6x 6x10	16x16x 6
	5x4 x6	8x4 x6		16x12x12
	4x4 x6	8x4 x4		12x12x16
		8x3½x8	12x12x10	

LIST OF SIZES

Standard Cast Iron Reducing Flanged Fittings (Continued)

REDUCING SINGLE SWEEP FLANGED TEES—Fig. No. 814

4x4x2	6x6x2½	8x 6x6	10x6x6
6x6x5	8x8x6	8x 6x4	.....
6x6x4	8x8x5	10x10x6	.....
6x6x3	8x8x3	10x 8x8	.....

REDUCING FLANGED CROSSES—Fig. No. 822

4x4x3 x3	6x6x5x5	8x 8x4x4	10x10x6x6
5x5x4 x4	6x6x4x4	8x 8x3x3	10x10x5x5
5x5x3 x3	6x6x3x3	8x 6x8x6	.....
5x5x2½x2½	8x8x6x6	8x 6x6x6	.....
6x6x6 x4	8x8x5x5	10x10x8x8	.....

REDUCING FLANGED LATERALS—Fig. No. 824

4x4x2½	8x 8x6	10x10x6
6x6x4	8x 6x6	10x 8x8
6x6x3	8x 8x3	.....
6x6x2½	10x10x8	.....

These sizes as listed above and on preceding page, with our reducing companion flanges, enable us to furnish from stock about every variety of fitting required except special angles, offsets, etc. See notes on pages 240 and 277.

PRICES OF SIZES NOT CARRIED IN STOCK

Sizes not covered in the list of sizes carried in stock as given above and on preceding page will be considered special and made to order at the following advance in prices, according to the quantity of a size ordered at one time, viz.:

Add to the regular list prices of Reducing Flanged Fittings on pages 234 to 237 the percentage advances given below.

Size	1 Piece	2 Pieces	3 Pieces	4 Pieces	5 Pieces	6 or More Pieces
3½ ins. and smaller.	100%	80%	60%	40%	20%	No advance
4 to 8 inches	50%	40%	30%	20%	10%	No advance
9 and 10 inch.....	25%	20%	15%	10%	5%	No advance

Sizes 12 inches and larger will be made to order in quantities of one or more of a size, at the regular list and discount.

We do not make Single Sweep Tees with outlets larger than run.

STANDARD CAST IRON FLANGED FITTINGS

Explanatory Notes on the American Standard

Size of all fittings scheduled indicates diameter of ports.

Standard Reducing Elbows carry the same dimensions center to face as regular Elbows of largest straight size.

Where Long Radius Fittings are specified, it has reference only to Elbows which are made in two center to face dimensions known as Elbows and Long Radius Elbows, the latter being used only when so specified.

Double Branch Elbows, whether straight or reducing, carry the same dimensions center to face and face to face as regular straight size Elbows and Tees.

Side Outlet Elbows and Side Outlet Tees, whether straight or reducing sizes, carry the same dimensions center to face and face to face as regular Tees having the same reductions.

Bull Head Tees or Tees increasing on outlet, will have same center to face and face to face dimensions as a straight fitting of the size of the outlet.

Standard Tees, Crosses and Laterals, reducing on run only, carry same dimensions face to face as largest straight size.

Tees, Crosses and Laterals, 16 inches and smaller, reducing on the outlet or branch use the same dimensions as straight sizes of the larger port.

Fittings, size 18 inches and larger, reducing on the outlet or branch are made in two lengths, depending on the size of the outlet as given in the table of dimensions.

The dimensions of reducing flanged fittings always are regulated by the reductions of the outlet or branch. Fittings reducing on the run only, the long body pattern will always be used.

The face to face dimension of Reducers is the same for either straight or eccentric pattern.

"Y's" are special and are made to suit conditions.

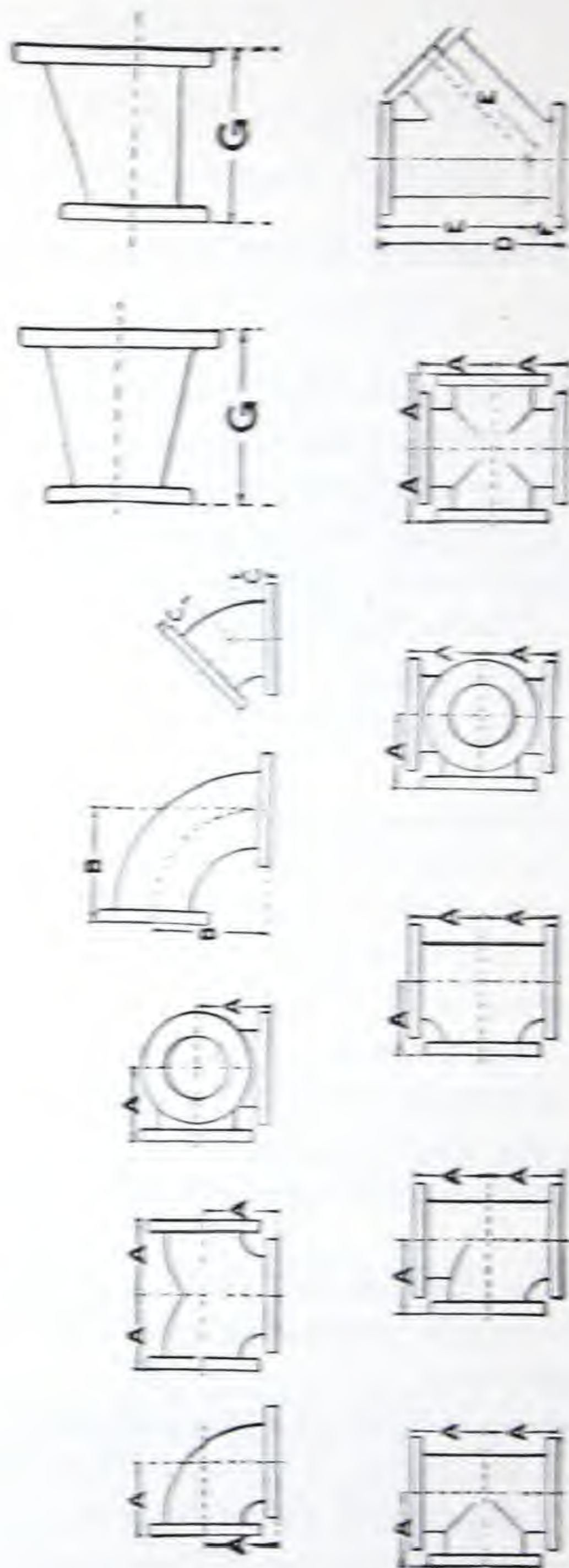
DIMENSIONS

Standard Cast Iron Flanged Fittings

125 Lbs. Steam Pressure

175 Lbs. Water Pressure

Straight Sizes



Standard Cast Iron Flanged Fittings

125 Lbs. Steam Pressure

175 Lbs. Water Pressure

Straight Sizes

Size	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4	4 1/2	5	6	7	8	9	10	12	14	15	16	18	20
AA—Face to Face Tees and Crosses	7	7 1/2	8	9	10	11	12	13	14	15	16	17	18	20	22	24	28	29	30	33	36
A—Center to Face Ells, Tees and Crosses	3 1/2	3 3/4	4	4 1/2	5	5 1/2	6	6 1/2	7	7 1/2	8	8 1/2	9	10	11	12	14	14 1/2	15	16 1/2	18
B—Center to Face Long Radius Ells	5	5 1/2	6	6 1/2	7	7 3/4	8 1/2	9	9 1/2	10 1/4	11 1/2	12 3/4	14	15 1/4	16 1/2	19	21 1/2	22 3/4	24	26 1/2	29
C—Center to Face 45° Ells	1 3/4	2	2 1/4	2 1/2	3	3	3 1/2	4	4	4 1/2	5	5 1/2	5 1/2	6	6 1/2	7 1/2	7 1/2	8	8	8 1/2	9 1/2
D—Face to Face Laterals	7 1/2	8	9	10 1/2	12	13	14 1/2	15	15 1/2	17	18	20 1/2	22	24	25 1/2	30	33	34 1/2	36 1/2	39	43
E—Center to Face Laterals	5 3/4	6 1/4	7	8	9 1/2	10	11 1/2	12	12 1/2	13 1/2	14 1/2	16 1/2	17 1/2	19 1/2	20 1/2	24 1/2	27	28 1/2	30	32	35
F—Center to Face Laterals	1 3/4	1 3/4	2	2 1/2	2 1/2	3	3	3	3	3 1/2	3 1/2	4	4 1/2	4 1/2	5	5 1/2	6	6	6 1/2	7	8
G—Face to Face Reducers	....	....	....	....	....	6	6 1/2	7	7 1/2	8	9	10	11	11 1/2	12	14	16	17	18	19	20
Diameter of Flanges	4	4 1/2	5	6	7	7 1/2	8 1/2	9	9 1/4	10	11	12 1/2	13 1/2	15	16	19	21	22 1/4	23 1/2	25	27 1/2
Thickness of Flanges	7/16	1/2	9/16	5/8	1 1/16	3/4	1 1/8	1 1/8	1 5/16	1 5/16	1	1 1/16	1 1/8	1 1/8	1 3/16	1 1/4	1 3/8	1 3/8	1 7/8	1 9/16	1 11/16

DIMENSIONS

Standard Cast Iron Flanged Fittings

125 Lbs. Steam Pressure

175 Lbs. Water Pressure

Straight Sizes (Continued)

Size.....	22	24	26	28	30	32	34	36	38	40	42	44	46	48	50	52	54	56	58	60
AA—Face to Face Tees and Crosses.....	40	44	46	48	50	52	54	56	58	60	62	64	66	68	70	74	78	82	84	88
A—Center to Face Ells, Tees and Crosses,	20	22	23	24	25	26	27	28	29	30	31	32	33	34	35	37	39	41	42	44
B—Center to Face Long Radius Ells	31½	34	36½	39	41½	44	46½	49	51½	54	56½	59	61½	64	66½	69	71½	74	76½	79
C—Center to Face 45° Ells.....	10	11	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
D—Face to Face Laterals	46	49½	53	56	59	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
E—Center to Face Laterals	37½	40½	44	46½	49	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
F—Center to Face Laterals	8½	9	9	9½	10	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
G—Face to Face Reducers.....	22	24	26	28	30	32	34	36	38	40	42	44	46	48	50	52	54	56	58	60
Diameter of Flanges.....	29½	32	34½	36½	38¾	41¾	43¾	46	48¾	50¾	53	55¼	57¼	59½	61¾	64	66¼	68¾	71	73
Thickness of Flanges	1½	1¾	2	2½	2½	2½	2½	2¾	2¾	2½	2½	2½	2½	2¾	2¾	2¾	3	3	3½	3½

DIMENSIONS

Standard Cast Iron Flanged Fittings

125 Lbs. Steam Pressure

175 Lbs. Water Pressure

Straight Sizes (Continued)

Size	62	64	66	68	70	72	74	76	78	80	82	84	86	88	90	92	94	96	98	100
A—A Face to Face Tees and Crosses	90	94	96	100	102	106	108	112	116	118	120	124	126	130	134	136	138	142	146	148
A—Cen. to Face Ells T's and C's	45	47	48	50	51	53	54	56	58	59	60	62	63	65	67	68	69	71	73	74
B—Cen. to Face Long Ra. Ells	81½	84	86½	89	91½	94	96½	99	101½	104	106½	109	111½	114	116½	119	121½	124	126½	129
C—Cen. to Face 45° Ells.....	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
G—Face to Face Reducers	62	64	66	68	70	72	74	76	78	80	82	84	86	88	90	92	94	96	98	100
Diam. of Flanges	75¾	78	80	82¼	84½	86½	88½	90¾	93	95¼	97½	99¾	102	104¼	106½	108¾	111	113¼	115½	117¾
Thick. of Flanges	3¼	3¼	3¾	3¾	3½	3½	3⅝	3⅝	3¾	3¾	3⅞	3⅞	4	4	4⅛	4⅛	4¼	4¼	4⅜	4⅜

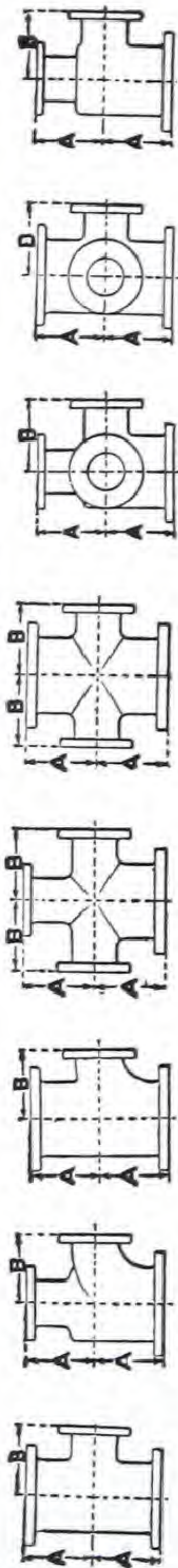
DIMENSIONS

Standard Cast Iron Flanged Fittings

125 Lbs. Steam Pressure

175 Lbs. Water Pressure

Reducing Tees and Crosses



SHORT BODY PATTERN.

Size.....	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4	4 1/2	5	6	7	8	9
*Size of Outlet and Smaller.....														
AA—Face to Face Run.....														
A—Center to Face Run.....														
B—Center to Face Outlet.....														
Size.....	10	12	14	15	16	18	20	22	24	26	28	30	32	34
*Size of Outlet and Smaller.....														
AA—Face to Face Run.....						12	14	15	16	18	18	20	20	22
A—Center to Face Run.....						26	28	28	30	32	32	36	36	38
B—Center to Face Outlet.....						13	14	14	15	16	16	18	18	19
						15 1/2	17	18	19	20	21	23	24	25

All Reducing Fittings 1" to 16" inclusive have the same center to face dimensions as straight fittings.

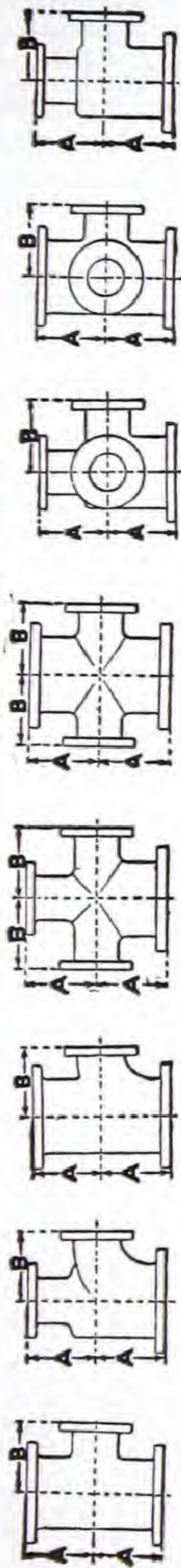
*LONG BODY PATTERNS are used when outlets are larger than given in the above table, therefor have same dimensions as straight size fittings. The dimensions of "Reducing Flanged Fittings" are always regulated by the reduction of the outlet. FITTINGS REDUCING ON THE RUN ONLY, the long body pattern will always be used except Double Sweep Tees, in which the reduced end is always longer than the regular fitting. Dimensions on request. BULL HEADS OR TEES having outlets larger than the run will be the same length center to face of all openings of the size of the outlet, for example: a 12 x 12 x 18-inch tee will be governed by the dimensions of the 18-inch long body tee; namely 16 1/2 inches center to face of all openings and 33 inches face to face. REDUCING ELBOWS carry same center to face dimensions as regular elbows of largest straight size.

Standard Cast Iron Flanged Fittings

125 Lbs. Steam Pressure

175 Lbs. Water Pressure

Reducing Tees and Crosses (Continued)



SHORT BODY PATTERN

Size	36	38	40	42	44	46	48	50	52	54	56	58	60	62	64	66	68
*Size of Outlet and Smaller	24	24	26	28	28	30	32	32	34	36	36	38	40	40	42	44	44
AA—Face to Face Run	40	40	44	46	46	48	52	52	54	58	58	62	66	66	68	70	70
A—Center to Face Run	20	20	22	23	23	24	26	26	27	29	29	31	33	33	34	35	35
B—Center to Face Outlet	26	28	29	30	31	33	34	35	36	37	39	40	41	42	44	45	46
Size	70	72	74	76	78	80	82	84	86	88	90	92	94	96	98	100	...
*Size of Outlet and Smaller	46	48	48	50	52	52	54	56	56	58	60	60	62	64	64	66	...
AA—Face to Face Run	74	80	80	84	86	86	88	94	94	96	100	100	104	106	106	110	...
A—Center to Face Run	37	40	40	42	43	43	44	47	47	48	50	50	52	53	53	55	...
B—Center to Face Outlet	47	48	49	50	52	53	54	56	57	58	61	62	63	64	65	67	...

*LONG BODY PATTERNS are used when outlets are larger than given in the above table, therefor have same dimensions as straight size fittings. The dimensions of "Reducing Flanged Fittings" are always regulated by the reduction of the outlet. FITTINGS REDUCING ON THE RUN ONLY, the long body pattern will always be used except Double Sweep Tees, on which the reduced end is always longer than the regular fitting. Dimensions on request. BULL HEADS OR TEES having outlet larger than the run, will be the same length center to face of all openings as a tee with all openings of the size of the outlet, for example: a 12 x 12 x 18-inch tee will be governed by the dimensions of the 18-inch long body tee; namely 16 1/2 inches center to face of all openings and 33 inches face to face. REDUCING ELBOWS, carry same center to face dimensions as regular elbows of largest straight size.

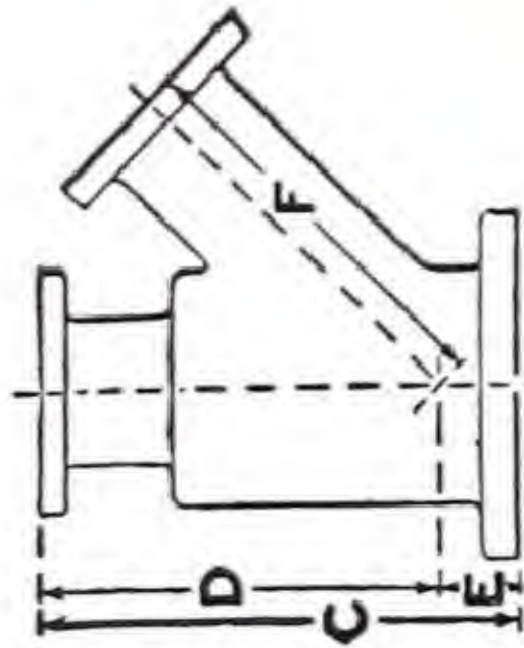
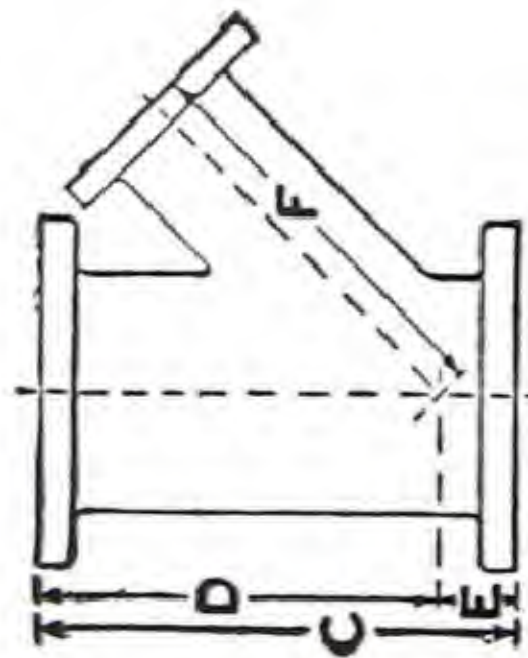
DIMENSIONS

Standard Cast Iron Flanged Fittings

125 Lbs. Steam Pressure

175 Lbs. Water Pressure

Reducing Laterals



SHORT BODY PATTERN.

Size	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4	4 1/2	5	6	7	8
{ All reducing fittings 1"-16" inclusive have same center to face dimensions as straight size fittings. }													
*Size of Branch and Smaller													
C—Face to Face, Run													
D—Center to Face, Run													
E—Center to Face, Run													
F—Center to Face, Branch													
Size	9	10	12	14	15	16	18	20	22	24	26	28	30
*Size of Branch and Smaller													
C—Face to Face, Run							9	10	10	12	12	14	15
D—Center to Face, Run							26	28	29	32	35	37	39
E—Center to Face, Run							25	27	28 1/2	31 1/2	35	37	39
F—Center to Face, Branch							1	1	1 1/2	1 1/2	0	0	0
							27 1/2	29 1/2	31 1/2	34 1/2	38	40	42

*LONG BODY PATTERNS are used when branches are larger than given in the above table, therefore have same dimensions as straight size fittings.
The dimensions of Reducing Flanged Fittings are always regulated by the reduction of the branch; fittings reducing on the run only, the long body pattern will always be used.

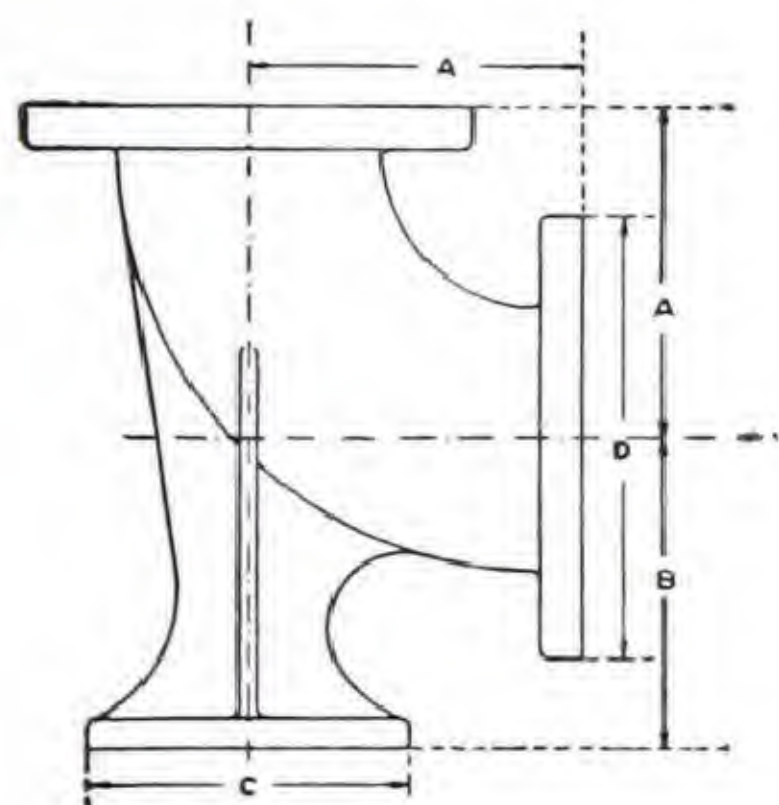
DIMENSIONS

Standard Cast Iron Flanged Fittings

25 Lbs. Steam Pressure

175 Lbs. Water Pressure

Base Elbows



NOTE:—Bases are round and will be drilled to order.

Size	A	B	C	D
2	4½	5	6	6
2½	5	5½	6	7
3	5½	5¾	6	7½
3½	6	6¼	6	8½
4	6½	6½	6	9
4½	7	6¾	6	9¼
5	7½	7	7	10
6	8	7½	7	11
7	8½	8¼	7	12½
8	9	8¾	9	13½
9	10	9½	9	15
10	11	10	9	16
12	12	11½	11	19
14	14	12½	11	21
15	14½	13⅛	11	22¼
16	15	13¾	11	23½
18	16½	14½	13½	25
20	18	15¾	13½	27½
22	20	17¾	13½	29½
24	22	18¾	13½	32

DIMENSIONS

*Templates for Drilling
Standard and Low Pressure Cast Iron
Flanged Valves and Fittings*

American 1914 Standard

Size Inches	Diameter of Flanges Inches	Thickness of Flanges Inches	Bolt Circle Inches	Number of Bolts	Size of Bolts Inches
1	4	$\frac{7}{16}$	3	4	$\frac{7}{16}$
$1\frac{1}{4}$	$4\frac{1}{2}$	$\frac{1}{2}$	$3\frac{3}{8}$	4	$\frac{7}{16}$
$1\frac{1}{2}$	5	$\frac{9}{16}$	$3\frac{7}{8}$	4	$\frac{1}{2}$
2	6	$\frac{5}{8}$	$4\frac{3}{4}$	4	$\frac{5}{8}$
$2\frac{1}{2}$	7	$\frac{11}{16}$	$5\frac{1}{2}$	4	$\frac{5}{8}$
3	$7\frac{1}{2}$	$\frac{3}{4}$	6	4	$\frac{5}{8}$
$3\frac{1}{2}$	$8\frac{1}{2}$	$\frac{13}{16}$	7	4	$\frac{5}{8}$
4	9	$\frac{15}{16}$	$7\frac{1}{2}$	8	$\frac{5}{8}$
$4\frac{1}{2}$	$9\frac{1}{4}$	$\frac{15}{16}$	$7\frac{3}{4}$	8	$\frac{3}{4}$
5	10	$\frac{15}{16}$	$8\frac{1}{2}$	8	$\frac{3}{4}$
6	11	1	$9\frac{1}{2}$	8	$\frac{3}{4}$
7	$12\frac{1}{2}$	$1\frac{1}{16}$	$10\frac{3}{4}$	8	$\frac{3}{4}$
8	$13\frac{1}{2}$	$1\frac{1}{8}$	$11\frac{3}{4}$	8	$\frac{3}{4}$
9	15	$1\frac{1}{8}$	$13\frac{1}{4}$	12	$\frac{3}{4}$
10	16	$1\frac{3}{16}$	$14\frac{1}{4}$	12	$\frac{7}{8}$
12	19	$1\frac{1}{4}$	17	12	$\frac{7}{8}$
14	21	$1\frac{3}{8}$	$18\frac{3}{4}$	12	1
15	$22\frac{1}{4}$	$1\frac{3}{8}$	20	16	1
16	$23\frac{1}{2}$	$1\frac{7}{16}$	$21\frac{1}{4}$	16	1
18	25	$1\frac{9}{16}$	$22\frac{3}{4}$	16	$1\frac{1}{8}$
20	$27\frac{1}{2}$	$1\frac{11}{16}$	25	20	$1\frac{1}{8}$
22	$29\frac{1}{2}$	$1\frac{13}{16}$	$27\frac{1}{4}$	20	$1\frac{1}{4}$
24	32	$1\frac{7}{8}$	$29\frac{1}{2}$	20	$1\frac{1}{4}$
26	$34\frac{1}{4}$	2	$31\frac{3}{4}$	24	$1\frac{1}{4}$
28	$36\frac{1}{2}$	$2\frac{1}{16}$	34	28	$1\frac{1}{4}$
30	$38\frac{3}{4}$	$2\frac{1}{8}$	36	28	$1\frac{3}{8}$
32	$41\frac{3}{4}$	$2\frac{1}{4}$	$38\frac{1}{2}$	28	$1\frac{1}{2}$
34	$43\frac{3}{4}$	$2\frac{5}{16}$	$40\frac{1}{2}$	32	$1\frac{1}{2}$
36	46	$2\frac{3}{8}$	$42\frac{3}{4}$	32	$1\frac{1}{2}$
38	$48\frac{3}{4}$	$2\frac{3}{8}$	$45\frac{1}{4}$	32	$1\frac{5}{8}$
40	$50\frac{3}{4}$	$2\frac{1}{2}$	$47\frac{1}{4}$	36	$1\frac{5}{8}$

These Drilling Templates are in multiples of four, so that fittings may be made to face in any quarter and bolt holes straddle the center line. Bolt holes are drilled $\frac{1}{8}$ -inch larger than nominal diameter of bolts.

DIMENSIONS

*Templates for Drilling
Standard and Low Pressure Cast Iron
Flanged Valves and Fittings*

*American 1914 Standard
(Continued)*

Size Inches	Diameter of Flanges Inches	Thickness of Flanges Inches	Bolt Circle Inches	Number of Bolts	Size of Bolts Inches
42	53	2 $\frac{5}{8}$	49 $\frac{1}{2}$	36	1 $\frac{5}{8}$
44	55 $\frac{1}{4}$	2 $\frac{5}{8}$	51 $\frac{3}{4}$	40	1 $\frac{5}{8}$
46	57 $\frac{1}{4}$	2 $\frac{11}{16}$	53 $\frac{3}{4}$	40	1 $\frac{5}{8}$
48	59 $\frac{1}{2}$	2 $\frac{3}{4}$	56	44	1 $\frac{5}{8}$
50	61 $\frac{3}{4}$	2 $\frac{3}{4}$	58 $\frac{1}{4}$	44	1 $\frac{3}{4}$
52	64	2 $\frac{7}{8}$	60 $\frac{1}{2}$	44	1 $\frac{3}{4}$
54	66 $\frac{1}{4}$	3	62 $\frac{3}{4}$	44	1 $\frac{3}{4}$
56	68 $\frac{3}{4}$	3	65	48	1 $\frac{3}{4}$
58	71	3 $\frac{1}{8}$	67 $\frac{1}{4}$	48	1 $\frac{3}{4}$
60	73	3 $\frac{1}{8}$	69 $\frac{1}{4}$	52	1 $\frac{3}{4}$
62	75 $\frac{3}{4}$	3 $\frac{1}{4}$	71 $\frac{3}{4}$	52	1 $\frac{7}{8}$
64	78	3 $\frac{1}{4}$	74	52	1 $\frac{7}{8}$
66	80	3 $\frac{3}{8}$	76	52	1 $\frac{7}{8}$
68	82 $\frac{1}{4}$	3 $\frac{3}{8}$	78 $\frac{1}{4}$	56	1 $\frac{7}{8}$
70	84 $\frac{1}{2}$	3 $\frac{1}{2}$	80 $\frac{1}{2}$	56	1 $\frac{7}{8}$
72	86 $\frac{1}{2}$	3 $\frac{1}{2}$	82 $\frac{1}{2}$	60	1 $\frac{7}{8}$
74	88 $\frac{1}{2}$	3 $\frac{5}{8}$	84 $\frac{1}{2}$	60	1 $\frac{7}{8}$
76	90 $\frac{3}{4}$	3 $\frac{5}{8}$	86 $\frac{1}{2}$	60	1 $\frac{7}{8}$
78	93	3 $\frac{3}{4}$	88 $\frac{3}{4}$	60	2
80	95 $\frac{1}{4}$	3 $\frac{3}{4}$	91	60	2
82	97 $\frac{1}{2}$	3 $\frac{7}{8}$	93 $\frac{1}{4}$	60	2
84	99 $\frac{3}{4}$	3 $\frac{7}{8}$	95 $\frac{1}{2}$	64	2
86	102	4	97 $\frac{3}{4}$	64	2
88	104 $\frac{1}{4}$	4	100	68	2
90	106 $\frac{1}{2}$	4 $\frac{1}{8}$	102 $\frac{1}{4}$	68	2 $\frac{1}{8}$
92	108 $\frac{3}{4}$	4 $\frac{1}{8}$	104 $\frac{1}{2}$	68	2 $\frac{1}{8}$
94	111	4 $\frac{1}{4}$	106 $\frac{1}{4}$	68	2 $\frac{1}{8}$
96	113 $\frac{1}{4}$	4 $\frac{1}{4}$	108 $\frac{1}{2}$	68	2 $\frac{1}{4}$
98	115 $\frac{1}{2}$	4 $\frac{3}{8}$	110 $\frac{3}{4}$	68	2 $\frac{1}{4}$
100	117 $\frac{3}{4}$	4 $\frac{3}{8}$	113	68	2 $\frac{1}{4}$

These Drilling Templates are in multiples of four, so that fittings may be made to face in any quarter and bolt holes straddle the center line.
Bolt holes are drilled $\frac{1}{8}$ -inch larger than nominal diameter of bolts.

EXTRA HEAVY CAST IRON FLANGED FITTINGS

Explanatory Notes

All Extra Heavy Cast Iron Flanged Fittings are recommended for Saturated Steam Working Pressures up to 250 pounds and Water Working Pressures up to 400 pounds.

All Extra Heavy Cast Iron Flanged Fittings are marked G-250.

All Extra Heavy Flanged Fittings and Flanges have a raised face, for gaskets, $\frac{1}{16}$ inch high inside of bolt holes. The bolt holes are drilled $\frac{1}{8}$ inch larger than the diameter of the bolts and straddle the centre line.

The bolt holes on Extra Heavy Cast Iron Flanged Fittings or Flanges will not be spot faced unless so ordered, for which an extra charge will be made.

All Extra Heavy Flanged Fittings ordered to comply with the A.S.M.E. Boiler Code are furnished spot faced.

Square Head Bolts with hexagonal nuts are recommended. For bolts $1\frac{5}{8}$ inches diameter and larger, studs with a nut on each end are satisfactory.

Hexagonal Nuts for pipe sizes 1 inch to 16 inches can be conveniently pulled up with open wrenches of minimum design of heads. Hexagonal Nuts for pipe sizes 18 inches to 48 inches can be conveniently pulled up with box wrenches.

All Fittings and Flanges will be furnished with Flanges Faced and Drilled unless otherwise specified.

Sweep Fittings

See note under Standard Cast Iron Flanged Fittings, page 228.

Notes on Standard Specifications for High-Test Gray-Iron Castings (Semi-Steel)

Grinnell High-Test Gray-Iron Castings are made to conform to the standard specifications of the American Society for Testing Materials.

These specifications cover all classes of gray-iron castings which are required to have a high strength, including those generally known as "Semi-Steel Castings."

High-Test Gray-Iron fittings are recommended for Saturated or Superheated Steam Pressures up to 250 pounds with a total temperature not exceeding 500 degrees Fahrenheit, and water, oil or gas working pressures up to 400 pounds on sizes 8 inch and smaller and 350 pounds on sizes 9 inch and larger. The above mentioned standard specifications require that tension test specimens shall show a minimum tensile strength of 28,000 lbs. per sq. inch.

When special tension tests are to be made under the supervision of customers inspector they will be made only at the expense of the purchaser.

EXTRA HEAVY CAST IRON FLANGED FITTINGS

Elbows

250 Lbs. Steam Pressure

400 Lbs. Water Pressure



Elbow
Fig. No. 831



45° Elbow
Fig. No. 832

LIST PRICES

ELBOW*—Fig. No. 831			45° ELBOW—Fig. No. 832		
Size Inches	With Flanges Faced	With Flanges Faced and Drilled	Size Inches	With Flanges Faced	With Flanges Faced and Drilled
1 1/4	\$4.50	\$5.40	1 1/4	\$5.00	\$5.90
1 1/2	4.50	5.40	1 1/2	5.00	5.90
2	4.50	5.40	2	5.00	5.90
2 1/2	4.75	5.65	2 1/2	5.25	6.15
3	5.15	6.25	3	5.65	6.75
3 1/2	6.10	7.35	3 1/2	6.75	8.00
4	6.75	8.25	4	7.50	9.00
4 1/2	8.25	9.75	4 1/2	9.00	10.50
5	9.35	10.85	5	10.35	11.85
6	11.40	13.40	6	12.50	14.50
7	15.75	18.00	7	16.50	18.75
8	18.00	20.50	8	19.00	21.50
9	25.50	28.85	9	26.75	30.10
10	28.50	32.50	10	30.00	34.00
12	42.00	46.50	12	44.00	48.50
14	62.00	67.50	14	62.00	67.50
15	70.00	77.00	15	70.00	77.00
16	82.00	90.00	16	82.00	90.00
18	106.00	115.00	18	106.00	115.00
20	135.00	145.00	20	135.00	145.00
22	170.00	183.00	22	170.00	183.00
24	210.00	225.00	24	210.00	225.00

For galvanized list prices, see page 265.

Made to order in High-Test Gray-Iron (Semi-Steel) at an advance of 0 per cent. for sizes 3 1/2 inch and smaller and 25 per cent. advance for sizes 4 inch and larger.

Order by Figure Number.

EXTRA HEAVY CAST IRON FLANGED FITTINGS

Taper Reducing Elbows

250 Lbs. Steam Pressure

400 Lbs. Water Pressure



Taper Reducing Elbow—Fig. No. 833

LIST PRICES

Size Inches	Price Faced	Price Faced and Drilled	Size Inches	Price Faced	Price Faced and Drilled
2 x 1 $\frac{1}{4}$	\$9.00	\$9.90	7x 6	\$31.50	\$33.75
2 x 1 $\frac{1}{2}$	9.00	9.90	8x 4	36.00	38.50
2 $\frac{1}{2}$ x 1 $\frac{1}{2}$	9.50	10.40	8x 5	36.00	38.50
2 $\frac{1}{2}$ x 2	9.50	10.40	8x 6	36.00	38.50
3 x 1 $\frac{1}{2}$	10.25	11.35	8x 7	36.00	38.50
3 x 2	10.25	11.35	10x 5	57.00	61.00
3 x 2 $\frac{1}{2}$	10.25	11.35	10x 6	57.00	61.00
3 $\frac{1}{2}$ x 2	12.25	13.50	10x 7	57.00	61.00
3 $\frac{1}{2}$ x 2 $\frac{1}{2}$	12.25	13.50	10x 8	57.00	61.00
3 $\frac{1}{2}$ x 3	12.25	13.50	12x 7	84.00	88.50
4 x 2	13.50	15.00	12x 8	84.00	88.50
4 x 2 $\frac{1}{2}$	13.50	15.00	12x 9	84.00	88.50
4 x 3	13.50	15.00	12x 10	84.00	88.50
4 x 3 $\frac{1}{2}$	13.50	15.00	14x 6	105.00	110.50
5 x 2 $\frac{1}{2}$	18.75	20.25	14x 10	105.00	110.50
5 x 3	18.75	20.25	14x 12	105.00	110.50
5 x 4	18.75	20.25	15x 6	120.00	127.00
6 x 3	22.75	24.75	15x 10	120.00	127.00
6 x 3 $\frac{1}{2}$	22.75	24.75	15x 12	120.00	127.00
6 x 4	22.75	24.75	16x 8	135.00	143.00
6 x 4 $\frac{1}{2}$	22.75	24.75	16x 10	135.00	143.00
6 x 5	22.75	24.75	16x 12	135.00	143.00
7 x 4	31.50	33.75	16x 14	135.00	143.00
7 x 5	31.50	33.75	.....	.....	.....

For galvanized list prices, see page 265.

Made to order in High-Test Gray-Iron (Semi-Steel) sizes 3 $\frac{1}{2}$ -inch and smaller at an advance of 50 per cent and sizes 4-inch and larger at an advance of 25 per cent.

Order by Figure Number.

EXTRA HEAVY CAST IRON FLANGED FITTINGS

Long Radius Elbows

250 Lbs. Steam Pressure

400 Lbs. Water Pressure



Long Radius Elbow
Fig. No. 834

LIST PRICES

Size Inches	With Flanges Faced	With Flanges Faced and Drilled	Radius Inches
2	\$ 7.50	\$ 8.85	5 $\frac{1}{4}$
2 $\frac{1}{2}$	8.00	9.35	5 $\frac{5}{8}$
3	8.60	10.25	6 $\frac{1}{4}$
3 $\frac{1}{2}$	10.25	12.15	6 $\frac{7}{8}$
4	11.25	13.50	7 $\frac{3}{8}$
4 $\frac{1}{2}$	13.75	16.00	7 $\frac{3}{4}$
5	15.50	17.75	8 $\frac{1}{2}$
6	19.00	22.00	9 $\frac{5}{8}$
7	26.50	29.85	10 $\frac{7}{8}$
8	30.00	33.75	12
9	42.50	47.50	13
10	47.75	53.75	14 $\frac{1}{8}$
12	70.00	76.75	16 $\frac{1}{2}$
14	103.50	111.75	18 $\frac{7}{8}$
15	117.00	127.00	20
16	137.00	149.00	21 $\frac{1}{4}$
18	177.00	191.00	23 $\frac{5}{8}$
20	225.00	240.00	26

For galvanized list prices, see page 265.

Made to order in High-Test Gray-Iron (Semi-Steel) sizes 3 $\frac{1}{2}$ inch and smaller at an advance of 50 per cent and sizes 4 inch and larger at an advance of 25 per cent.

Order by Figure Number.

EXTRA HEAVY CAST IRON FLANGED FITTINGS

Base Elbows

250 Lbs. Steam Pressure

400 Lbs. Water Pressure



Base Elbow
Fig. No. 835

Size Inches	Faced Except Base Flange	Faced and Drilled Except Base Flange	Facing and Drilling of Base Flange
4	\$13.50	\$15.00	\$4.50
4½	16.50	18.00	4.50
5	18.75	20.25	5.25
6	22.75	24.75	5.25
7	31.50	33.75	5.25
8	36.00	38.50	7.50
9	51.00	54.35	7.50
10	57.00	61.00	7.50
12	84.00	88.50	11.00
14	105.00	110.50	11.00
15	120.00	127.00	11.00
16	135.00	143.00	11.00

For galvanized list prices, see page 265.

Made to order in High-Test Gray-Iron (Semi-Steel) at an advance of 25%.

Specify whether or not base flange is to be faced and drilled.
Order by Figure Number.

EXTRA HEAVY CAST IRON FLANGED FITTINGS

Side Outlet Elbows—Double Branch Elbows

250 Lbs. Steam Pressure

Double Branch Elbow, Straight
Fig. No. 836

400 Lbs. Water Pressure

Double Branch Elbow, Reducing
Fig. No. 837Side Outlet Elbow, Straight
Fig. No. 838Side Outlet Elbow, Reducing
Fig. No. 839

LIST PRICES

Size Inches	DOUBLE BRANCH ELBOWS				SIDE OUTLET ELBOWS			
	Str. Fig. No. 836		Red. Fig. No. 837		Str. Fig. No. 838		Red. Fig. No. 839	
	Faced Each	Faced and Drilled Each	Faced Each	Faced and Drilled Each	Faced Each	Faced and Drilled Each	Faced Each	Faced and Drilled Each
4	\$35.75	\$38.00	\$39.75	\$42.00	\$35.75	\$38.00	\$39.75	\$42.00
5	42.75	45.00	47.75	50.00	37.75	40.00	41.75	44.00
6	49.50	52.50	54.50	57.50	42.00	45.00	47.00	50.00
7	56.50	60.00	62.50	66.00	51.75	55.00	56.75	60.00
8	66.25	70.00	73.75	77.50	61.25	65.00	67.25	71.00
10	84.00	90.00	94.00	100.00	89.00	95.00	99.00	105.00
12	108.25	115.00	118.25	125.00	113.25	120.00	123.25	130.00
14	141.75	150.00	156.75	165.00	146.75	155.00	161.75	170.00
16	168.00	180.00	188.00	200.00	168.00	180.00	183.00	195.00

Made to order of High-Test Gray-Iron (Semi-Steel) at an advance of 25%.

When ordering either Side Outlet or Double Branch Elbows, please furnish sketch showing exact size of all openings.

On Side Outlet Elbows state whether Side Outlet is to be on radial or intersecting lines. Double Branch Elbows having two different sizes of branches or reducing on outlet are considered special and are made to order at special net prices.

Order by Figure Number.

EXTRA HEAVY CAST IRON FLANGED FITTINGS

Tees

250 Lbs. Steam Pressure

400 Lbs. Water Pressure

Tee, Straight
Fig. No. 841Tees, Reducing on Run or Outlet
Fig. No. 842

LIST PRICES

TEES, STRAIGHT—Fig. No. 841			TEES, REDUCING—Fig. No. 842		
Size Inches	With Flanges Faced	With Flanges Faced and Drilled	Size Inches	With Flanges Faced	With Flanges Faced and Drilled
1¼	\$6.50	\$7.85	1½	\$7.50	\$8.85
1½	6.50	7.85	2	7.50	8.85
2	6.50	7.85	2½	8.00	9.35
2½	6.90	8.25	3	8.60	10.25
3	7.50	9.15	3½	10.25	12.15
3½	8.90	10.80	4	11.25	13.50
4	9.75	12.00	4½	13.75	16.00
4½	12.00	14.25	5	15.50	17.75
5	13.50	15.75	6	19.00	22.00
6	16.50	19.50	7	26.50	29.85
7	23.00	26.35	8	30.00	33.75
8	26.00	29.75	9	42.50	47.50
9	37.00	42.00	10	47.75	53.75
10	41.50	47.50	12	70.00	76.75
12	61.00	67.75	14	103.50	111.75
14	90.00	98.25	15	117.00	127.00
15	102.00	112.00	16	137.00	149.00
16	119.00	131.00	18	177.00	191.00
18	154.00	168.00	20	225.00	240.00
20	195.00	210.00	22	285.00	305.00
22	247.00	267.00	24	350.00	373.00
24	305.00	328.00			

For galvanized list prices, see page 265.

See page 268 for advanced prices beyond regular list and discount on Extra Heavy Reducing Flanged Tees not carried in stock.

For list of reducing sizes carried in stock, see pages 266 to 268.

Made to order in High-Test Gray-Iron (Semi-Steel) sizes 3½-inch and smaller, at an advance of 50 per cent and sizes 4-inch and larger at an advance of 25 per cent.

Order by Figure Number.

EXTRA HEAVY CAST IRON FLANGED FITTINGS

Single Sweep Tees—Side Outlet Tees

250 Lbs. Steam Pressure

400 Lbs. Water Pressure

Single Sweep Tee, Straight
Fig. No. 843Single Sweep Tee, Reducing
Fig. No. 844Side Outlet Tee, Straight
Fig. No. 847Side Outlet Tee, Reducing
Fig. No. 848

Size Inches	SINGLE SWEEP TEES				SIDE OUTLET TEES			
	Str. Fig. No. 843		Red. Fig. No. 844		Str. Fig. No. 847		Red. Fig. No. 848	
	Faced	Faced and Drilled	Faced	Faced and Drilled	Faced	Faced and Drilled	Faced	Faced and Drilled
2	\$7.50	\$8.85	.....	.....	.....	.....	.....	.....
2½	8.00	9.35	9.15	10.50	.....	.....	.....	.....
3	8.60	10.25	9.90	11.55	.....	.....	.....	.....
3½	10.25	12.15	11.75	13.65	.....	.....	.....	.....
4	11.25	13.50	13.00	15.25	\$42.00	\$45.00	\$47.00	\$50.00
4½	13.75	16.00	15.75	18.00	.....	.....	.....	.....
5	15.50	17.75	17.85	20.10	47.00	50.00	52.00	55.00
6	19.00	22.00	22.00	25.00	53.50	57.50	59.00	63.00
7	26.50	29.85	30.50	33.85	63.00	67.50	70.50	75.00
8	30.00	33.75	34.50	38.25	72.50	77.50	80.00	85.00
9	42.50	47.50	49.00	54.00	.....	.....	.....	.....
10	47.75	53.75	55.00	61.00	102.00	110.00	112.00	120.00
12	70.00	76.75	80.00	86.75	131.00	140.00	146.00	155.00
14	103.50	111.75	119.00	127.25	159.00	170.00	174.00	185.00
15	117.00	127.00	135.00	145.00	.....	.....	.....	.....
16	137.00	149.00	158.00	170.00	184.00	200.00	204.00	220.00
18	177.00	191.00	204.00	218.00	.....	.....	.....	.....
20	225.00	240.00	260.00	275.00	.....	.....	.....	.....
22	285.00	305.00	327.00	347.00	.....	.....	.....	.....
24	350.00	373.00	402.00	425.00	.....	.....	.....	.....

See Page 268 for advanced prices beyond regular list and discount on Extra Heavy Reducing Single Sweep Tees not carried in stock.

For List of Reducing Sizes carried in stock, see pages 266 to 268.

Made in High-Test Gray-Iron (Semi-Steel) sizes 3½-inch and smaller at an advance of 50% and sizes 4 inches and larger at an advance of 25%.

Order by Figure Number.

EXTRA HEAVY CAST IRON FLANGED FITTINGS

Crosses

250 Lbs. Steam Pressure

400 Lbs. Water Pressure



Cross, Straight—Fig. No. 851



Cross, Reducing—Fig. No. 852

LIST PRICES

CROSSES, STRAIGHT—Fig. No. 851			CROSSES, REDUCING—Fig. No. 852		
Size Inches	With Flanges Faced	With Flanges Faced and Drilled	Size Inches	With Flanges Faced	With Flanges Faced and Drilled
1¼	\$10.00	\$11.80	.....	.....	.....
1½	10.00	11.80	.....	.....	.....
2	10.00	11.80	2	\$11.50	\$13.30
2½	10.50	12.30	2½	12.00	13.80
3	11.50	13.75	3	13.25	15.50
3½	13.50	16.00	3½	15.50	18.00
4	15.00	18.00	4	17.00	20.00
4½	18.00	21.00	4½	21.00	24.00
5	20.50	23.50	5	23.50	26.50
6	25.00	29.00	6	29.00	33.00
7	35.00	39.50	7	40.00	44.50
8	40.00	45.00	8	46.00	51.00
9	56.00	62.75	9	65.00	71.75
10	63.00	71.00	10	72.00	80.00
12	92.00	101.00	12	106.00	115.00
14	136.00	147.00	14	158.00	169.00
15	155.00	169.00	15	177.00	191.00
16	180.00	196.00	16	207.00	223.00
18	235.00	253.00	18	270.00	288.00
20	300.00	320.00	20	345.00	365.00
22	375.00	401.00	22	430.00	456.00
24	465.00	495.00	24	535.00	565.00

For galvanized list prices, see page 265.

See page 268 for advanced prices beyond regular list and discount on extra heavy reducing flanged crosses not carried in stock. For list of reducing sizes carried in stock see pages 266 to 268.

Made to order in High-Test Gray-Iron (Semi-Steel) sizes 3½-inch and smaller at an advance of 50 per cent and sizes 4-inch and larger at an advance of 25 per cent.

Order by Figure Number.

EXTRA HEAVY CAST IRON FLANGED FITTINGS

Laterals

250 Lbs. Steam Pressure

400 Lbs. Water Pressure



Lateral—Fig. No. 853



Reducing Lateral—Fig. No. 854

LIST PRICES

LATERAL—Fig. No. 853			REDUCING LATERAL—Fig. No. 854		
Size Inches	With Flanges Faced Each	With Flanges Faced and Drilled Each	Size Inches	With Flanges Faced Each	With Flanges Faced and Drilled Each
2	\$10.00	\$11.80	.....	.....	.....
2½	10.50	12.30	2½	\$12.00	\$13.80
3	11.50	13.75	3	13.25	15.50
3½	13.50	16.00	3½	15.50	18.00
4	15.00	18.00	4	17.00	20.00
4½	18.00	21.00	4½	21.00	24.00
5	20.50	23.50	5	23.50	26.50
6	25.00	29.00	6	29.00	33.00
7	35.00	39.50	7	40.00	44.50
8	40.00	45.00	8	46.00	51.00
9	56.00	62.75	9	65.00	71.75
10	63.00	71.00	10	72.00	80.00
12	92.00	101.00	12	106.00	115.00
14	136.00	147.00	14	158.00	169.00
15	155.00	169.00	15	177.00	191.00
16	180.00	196.00	16	207.00	223.00
18	235.00	253.00	18	270.00	288.00
20	300.00	320.00	20	345.00	365.00
22	375.00	401.00	22	430.00	456.00
24	465.00	495.00	24	535.00	565.00

For galvanized list prices, see page 265.

See page 268 for advanced prices beyond regular list and discount on Extra Heavy Reducing Flanged Laterals not carried in stock.

For list of Reducing Sizes carried in stock, see pages 266 to 268.

Made to order in High-Test Gray-Iron (Semi-Steel) sizes 3½-inch and smaller at an advance of 50 per cent and sizes 4-inch and larger at an advance of 25 per cent.

Order by Figure Number.

EXTRA HEAVY CAST IRON FLANGED FITTINGS

Reducers

250 Lbs. Steam Pressure



Taper Reducer—Fig. No. 855

400 Lbs. Water Pressure

Eccentric Taper Reducer—Fig. No. 856
Prices on application

LIST PRICES—Fig. No. 855

Size Inches	With Flanges Faced Each	With Flanges Faced and Drilled Each	Size Inches	With Flanges Faced Each	With Flanges Faced and Drilled Each
2½x2	\$9.50	\$10.40	12x10	\$ 84.00	\$ 88.50
3 x2	10.25	11.35	14x 6	105.00	110.50
3½x2½	12.25	13.50	14x 8	105.00	110.50
4 x2	13.50	15.00	14x10	105.00	110.50
4 x2½	13.50	15.00	14x12	105.00	110.50
4 x3	13.50	15.00	15x 8	120.00	127.00
5 x2	18.75	20.25	15x10	120.00	127.00
5 x2½	18.75	20.25	15x12	120.00	127.00
5 x3	18.75	20.25	15x14	120.00	127.00
5 x4	18.75	20.25	16x 8	135.00	143.00
6 x3	22.75	24.75	16x10	135.00	143.00
6 x3½	22.75	24.75	16x12	135.00	143.00
6 x4	22.75	24.75	16x14	135.00	143.00
6 x5	22.75	24.75	18x10	157.00	166.00
7 x3	31.50	33.75	18x12	157.00	166.00
7 x4	31.50	33.75	18x14	157.00	166.00
7 x5	31.50	33.75	18x16	157.00	166.00
7 x6	31.50	33.75	20x12	180.00	190.00
8 x3	36.00	38.50	20x14	180.00	190.00
8 x4	36.00	38.50	20x16	180.00	190.00
8 x5	36.00	38.50	20x18	180.00	190.00
8 x6	36.00	38.50	22x14	225.00	238.00
10 x4	57.00	61.00	22x16	225.00	238.00
10 x5	57.00	61.00	22x18	225.00	238.00
10 x6	57.00	61.00	22x20	225.00	238.00
10 x8	57.00	61.00	24x16	285.00	300.00
12 x5	84.00	88.50	24x18	285.00	300.00
12 x6	84.00	88.50	24x20	285.00	300.00
12 x8	84.00	88.50	24x22	285.00	300.00

For galvanized list prices, see page 265.

Made to order in High-Test Gray-Iron (Semi-Steel) at special net prices.
Order by Figure Number.

EXTRA HEAVY FLANGED FITTINGS AND FLANGES

Extra Price For Galvanizing

LIST PRICE FOR GALVANIZING ONLY

Size Inches	Elbows Reducing Elbows 45° Elbows Taper Reducers Each Extra	Tees and Reducing Tees Base Elbows Long Radius Elbows Each Extra	Crosses and Reducing Crosses Laterals and Reducing Laterals Each Extra	Companion Flanges Each Extra	Reducing Companion Flanges Solid Flanges Each Extra
1	.....	.....	.....	\$0.85	\$1.25
1¼	\$3.00	\$4.50	\$6.00	.85	1.25
1½	3.00	4.50	6.00	.85	1.25
2	3.00	4.50	6.00	1.00	1.50
2½	3.10	4.65	6.25	1.05	1.60
3	3.50	5.25	7.00	1.15	1.75
3½	4.10	6.15	8.25	1.40	2.10
4	4.50	6.75	9.00	1.65	2.50
4½	5.50	8.25	11.00	1.75	2.65
5	6.00	9.00	12.00	1.90	2.85
6	7.50	11.25	15.00	2.30	3.50
7	10.00	15.00	20.00	3.00	4.50
8	11.25	16.75	22.50	3.50	5.25
9	16.00	24.00	32.00	4.15	6.25
10	18.00	27.00	36.00	5.25	8.00
12	26.00	39.00	52.00	7.00	10.50
14	37.50	56.00	75.00	10.00	15.00
15	44.00	66.00	88.00	12.50	19.00
16	50.00	75.00	100.00	15.00	22.50

EXTRA HEAVY CAST IRON REDUCING FLANGED FITTINGS



Showing Reducing Flange Bolted On

It is not possible to carry in stock at all times a line of Reducing Flanged Fittings complete and large enough to meet all demands of the trade promptly. It is our policy however to carry a complete line of straight sizes and an extensive line of Reducing Flanged Fittings in sizes most called for, as given on the following pages.

To avoid delay in shipment, where other than sizes given on the following pages are ordered, we carry in stock a complete line of Reducing Flanges as given on page 325. The use of these Flanges in connection with straight or reducing fittings carried in stock, enable us to promptly fill orders for reducing sizes, where specifications will permit of reduction being made in this manner.

Customers who desire fittings reduced in this manner will please specify "Reduce by Flanges if Necessary." The Reducing Flanges furnished are the same thickness as the regular companion flange of the corresponding outside diameter and will be drilled to the template corresponding to the outside diameter unless otherwise ordered.

To order Reducing Companion Flanges, specify screwed or reduced size first, then the outside diameter of flange wanted, for instance, if a Reducing Flange is required to connect a 4 inch pipe to a 9 inch valve or fitting having a $16\frac{1}{4}$ inch O.D. Flange.

ORDER A 4 x $16\frac{1}{4}$ X. H. REDUCING FLANGE

This will avoid error and the confusion which so often is caused by incorrectly calling for a 4 x 9 or a 9 x 4 X. H. Flange.

LIST OF SIZES

*Extra Heavy Cast Iron
Reducing Flanged Fittings*

REDUCING FLANGED TEES—Fig. No. 842

$\frac{1}{2}$ x2 $\frac{1}{2}$ x2	4 x2 x3	6 x5 x3	8x 7x 5	8x 8x10
$\frac{1}{2}$ x2 $\frac{1}{2}$ x1 $\frac{1}{2}$	3 x3 x4	6 x5 x2 $\frac{1}{2}$	8x 6x 8	7x 7x10
$\frac{1}{2}$ x2 $\frac{1}{2}$ x1 $\frac{1}{4}$	2 $\frac{1}{2}$ x2 $\frac{1}{2}$ x4	6 x5 x2	8x 6x 7	
$\frac{1}{2}$ x2 x2		6 x4 x6	8x 6x 6	12x12x10
x3 x2 $\frac{1}{2}$	4 $\frac{1}{2}$ x4 $\frac{1}{2}$ x3	6 x4 x5	8x 6x 5	12x12x 9
x3 x2	4 $\frac{1}{2}$ x4 $\frac{1}{2}$ x2	6 x4 x4	8x 6x 4	12x12x 8
x3 x1 $\frac{1}{2}$	4 $\frac{1}{2}$ x4 x4 $\frac{1}{2}$	6 x4 x3	8x 5x 6	12x12x 7
x3 x1 $\frac{1}{4}$		6 x3 x6	8x 5x 5	12x12x 6
x3 x1	5 x5 x4	6 x3 x3	8x 4x 8	12x12x 5
x2 $\frac{1}{2}$ x3	5 x5 x3 $\frac{1}{2}$	6 x2 $\frac{1}{2}$ x6	8x 4x 6	12x12x 4
x2 $\frac{1}{2}$ x2 $\frac{1}{2}$	5 x5 x3	5 x5 x6	8x 4x 4	12x12x 3
x2 x3	5 x5 x2 $\frac{1}{2}$	4 $\frac{1}{2}$ x4 $\frac{1}{2}$ x6	8x 3x 8	12x12x 2 $\frac{1}{2}$
x2 x2	5 x5 x2	4 x4 x6	6x 6x 8	12x10x12
x1 $\frac{1}{2}$ x3	5 x5 x1 $\frac{1}{2}$		5x 5x 8	12x10x10
x1 $\frac{1}{4}$ x3	5 x4 x5	7 x7 x6		12x10x 8
x2 x3	5 x4 x4	7 x7 x5	9x 9x 6	12x10x 6
	5 x4 x3	7 x7 x4	9x 9x 5	12x 8x12
	5 x4 x2 $\frac{1}{2}$	7 x7 x3		12x 8x 8
$\frac{1}{2}$ x3 $\frac{1}{2}$ x2 $\frac{1}{2}$	5 x3 x5	7 x7 x2	10x10x 8	12x 8x 6
$\frac{1}{2}$ x3 $\frac{1}{2}$ x2	5 x3 x4	7 x6 x7	10x10x 7	10x10x12
$\frac{1}{2}$ x2 $\frac{1}{2}$ x3 $\frac{1}{2}$	5 x3 x3	7 x6 x6	10x10x 6	8x 8x12
	5 x2 $\frac{1}{2}$ x5	7 x5 x5	10x10x 5	
x4 x3 $\frac{1}{2}$	4 x4 x5	6 x6 x7	10x10x 4 $\frac{1}{2}$	14x14x12
x4 x3			10x10x 4	14x14x10
x4 x2 $\frac{1}{2}$	6 x6 x5	8 x8 x7	10x10x 3 $\frac{1}{2}$	14x14x 8
x4 x2	6 x6 x4 $\frac{1}{2}$	8 x8 x6	10x10x 3	14x14x 7
x4 x1 $\frac{1}{2}$	6 x6 x4	8 x8 x5	10x10x 2	14x14x 6
x3 x4	6 x6 x3 $\frac{1}{2}$	8 x8 x4 $\frac{1}{2}$	10x 8x10	14x14x 5
x3 x3	6 x6 x3	8 x8 x4	10x 8x 8	14x12x 8
x3 x2	6 x6 x2 $\frac{1}{2}$	8 x8 x3 $\frac{1}{2}$	10x 8x 6	
x3 x1 $\frac{1}{2}$	6 x6 x2	8 x8 x3	10x 8x 5	16x16x10
x2 $\frac{1}{2}$ x4	6 x5 x6	8 x8 x2 $\frac{1}{2}$	10x 6x10	16x16x 8
x2 $\frac{1}{2}$ x2 $\frac{1}{2}$	6 x5 x5	8 x8 x2	10x 6x 8	16x16x 7
x2 x4	6 x5 x4	8 x7 x6	10x 6x 6	16x16x 6

LIST OF SIZES
Extra Heavy Cast Iron
Reducing Flanged Fittings
 (Continued)

REDUCING SINGLE SWEEP FLANGED TEES—Fig. No. 844

4x4x2½ 4x4x2	6x6x4 6x4x4	8x8x6 8x6x6
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REDUCING FLANGED CROSSES—Fig. No. 852

3x3x2½x2½ 4x4x2½x2½	6x6x4x4 6x6x3x3	8x8x6x6 8x8x5x5 8x8x4x4
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REDUCING FLANGED LATERALS—Fig. No. 854

4x4x2½	6x6x2½
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These sizes as listed above and on preceding page with our Reducing Companion Flanges enable us to furnish from stock about every variety of fittings required, except special angles, offsets, etc. See notes on pages 266 and 277.

PRICES OF SIZES NOT CARRIED IN STOCK

Sizes not covered in the list of sizes carried in stock as given above and on preceding page will be considered special and made to order at the following advance in prices according to the quantity of a size ordered at one time, viz: Add to the regular list prices of Reducing Flanged Fittings on pages 260 to 263 the percentage advances given below.

Size	1 Piece	2 Pieces	3 Pieces	4 Pieces	5 Pieces	6 or More
3½ inch and smaller	50%	40%	30%	20%	10%	No advance
4 to 8 inch	25%	20%	15%	10%	5%	No advance

Sizes 9 inches and larger will be made to order in quantities of one or more of a size, at the regular list and discount.

We do not make Single Sweep Tees with side openings larger than the run.

EXTRA HEAVY CAST IRON FLANGED FITTINGS

Explanatory Notes on the American Standard

Size of all fittings scheduled indicates diameter of ports.

Extra Heavy Reducing Elbows carry the same dimensions center to face as regular Elbows of largest straight size.

Where Long Radius Fittings are specified, it has reference only to Elbows which are made in two center to face dimensions known as Elbows and Long Radius Elbows, the latter being used only when so specified.

Double Branch Elbows, whether straight or reducing, carry same dimensions center to face and face to face as regular straight size Elbows and Tees.

Side Outlet Elbows and Side Outlet Tees, whether straight or reducing sizes, carry the same dimensions center to face and face to face as regular Tees having same reductions.

Bull Head Tees or Tees increasing on outlet will have the same center to face and face to face dimensions as a straight fitting of the size of the outlet.

Extra Heavy Tees, Crosses and Laterals, reducing on the run only, carry same dimensions face to face as largest straight size.

Tees, Crosses and Laterals 16 inches and smaller, reducing on the outlet or branch, use the same dimensions as straight sizes of the larger port.

Fittings, 18 inches and larger, reducing on the outlet or branch, are made in two lengths depending on the size of the outlet as given in the table of dimensions.

The dimensions of reducing flanged fittings are always regulated by the reductions of the outlet or branch. Fittings reducing on the run only, the long body pattern will always be used.

The face to face dimension of Reducers is the same for either straight or eccentric pattern.

"Y's" are special and are made to suit conditions.

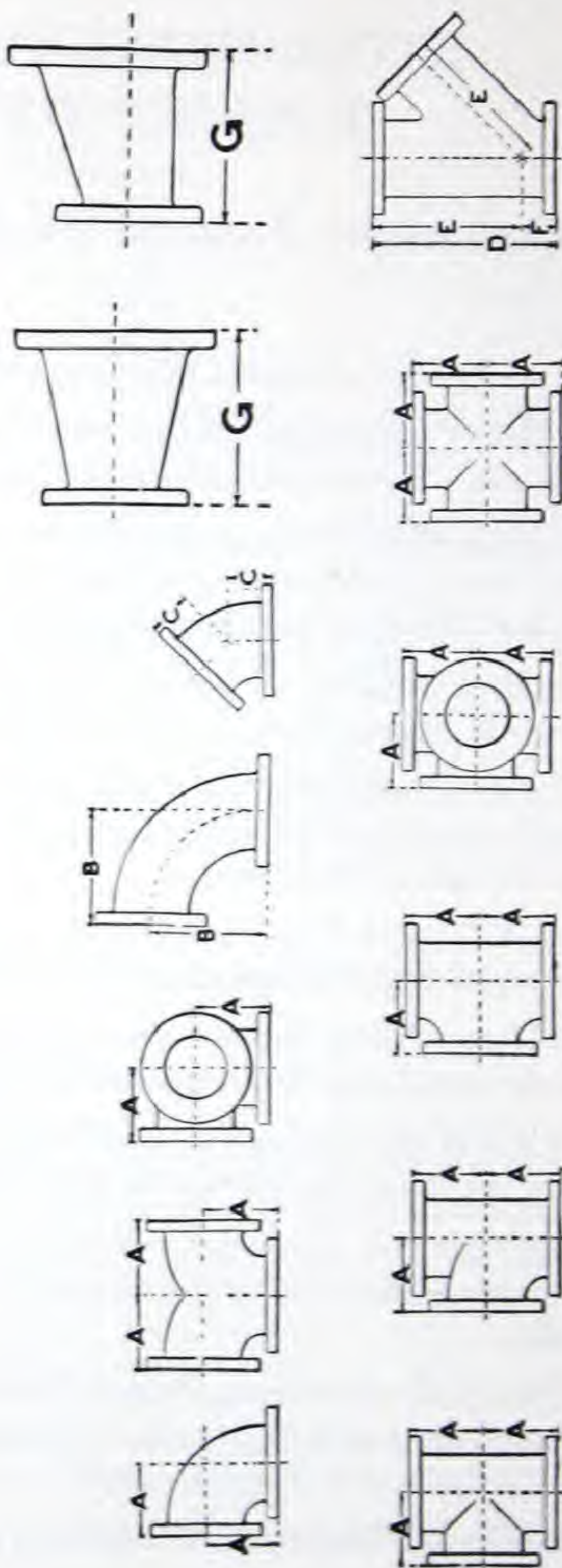
DIMENSIONS

Extra Heavy Cast Iron Flanged Fittings

250 Lbs. Steam Pressure

400 Lbs. Water Pressure

Straight Sizes



NOTE:—All Extra Heavy Flanges have a $\frac{1}{16}$ -inch Raised Face inside of bolt holes. This Raised Face is included in face to face, center to face and thickness of flange dimensions.

Extra Heavy Cast Iron Flanged Fittings

250 Lbs. Steam Pressure

400 Lbs. Water Pressure

Straight Sizes

Size.....	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4	4 1/2	5	6	7	8	9	10	12	14	15
AA—Face to Face Tees and Crosses	8	8 1/2	9	10	11	12	13	14	15	16	17	18	20	21	23	26	30	31
A—Center to Face Ells, T's, and C'ss.	4	4 1/4	4 1/2	5	5 1/2	6	6 1/2	7	7 1/2	8	8 1/2	9	10	10 1/2	11 1/2	13	15	15 1/2
B—Center to Face Long Radius Ells	5	5 1/2	6	6 1/2	7	7 3/4	8 1/2	9	9 1/2	10 1/4	11 1/2	12 3/4	14	15 1/4	16 1/2	19	21 1/2	22 3/4
C—Center to Face 45° Ells.....	2	2 1/2	2 3/4	3	3 1/2	3 1/2	4	4 1/2	4 1/2	5	5 1/2	6	6	6 1/2	7	8	8 1/2	9
D—Face to Face Laterals.....	8 1/2	9 1/2	11	11 1/2	13	14	15 1/2	16 1/2	18	18 1/2	21 1/2	23 1/2	25 1/2	27 1/2	29 1/2	33 1/2	37 1/2	39 1/2
E—Center to Face Laterals.....	6 1/2	7 1/4	8 1/2	9	10 1/2	11	12 1/2	13 1/2	14 1/2	15	17 1/2	19	20 1/2	22 1/2	24	27 1/2	31	33
F—Center to Face Laterals.....	2	2 1/4	2 1/2	2 1/2	2 1/2	3	3	3	3 1/2	3 1/2	4	4 1/2	5	5	5 1/2	6	6 1/2	6 1/2
G—Face to Face Reducers.....	....	....	....	....	....	6	6 1/2	7	7 1/2	8	9	10	11	11 1/2	12	14	16	17
Diam. of Flanges	4 1/2	5	6	6 1/2	7 1/2	8 1/4	9	10	10 1/2	11	12 1/2	14	15	16 1/4	17 1/2	20 1/2	23	24 1/2
Thick. of Flanges	1 1/8	3/4	1 3/16	7/8	1	1 1/8	1 3/16	1 1/4	1 5/16	1 3/8	1 7/16	1 1/2	1 5/8	1 3/4	1 7/8	2	2 1/8	2 3/16

DIMENSIONS

Extra Heavy Cast Iron Flanged Fittings

250 Lbs. Steam Pressure 400 Lbs. Water Pressure

Straight Sizes (Continued)

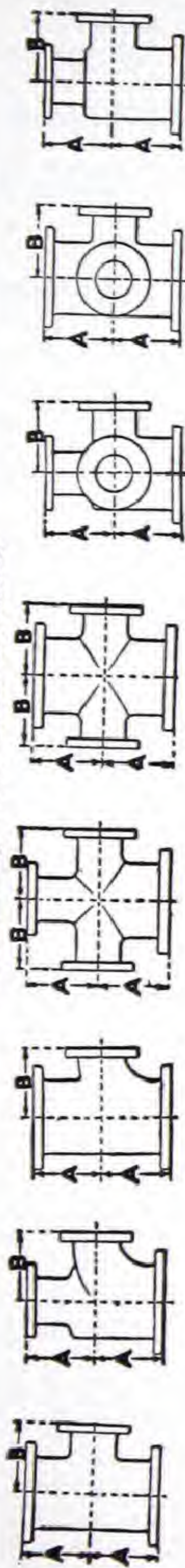
Size	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48
AA—Face to Face Tees and Crosses	33	36	39	41	45	48	52	55	58	61	65	68	71	74	78	81	84
A—Center to Face Ells, Tees and Crosses	16½	18	19½	20½	22½	24	26	27½	29	30½	32½	34	35½	37	39	40½	42
B—Center to Face Long Radius Ells . . .	24	26½	29	31½	34	36½	39	41½	44	46½	49	51½	54	56½	59	61½	64
C—Center to Face 45° Ells	9½	10	10½	11	12	13	14	15	16	17	18	19	20	21	22	23	24
D—Face to Face Laterals	42	45½	49	53	57½	61	65	69	73	77	81	85	89	93	97	101	105
E—Center to Face Laterals	34½	37½	40½	43½	47½	50½	54	57	60	63	66	69	72	75	78	81	84
F—Center to Face Laterals	7½	8	8½	9½	10	11	12	13	14	15	16	17	18	19	20	21	22
G—Face to Face Reducers	18	19	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48
Diameter of Flanges	25½	28	30½	33	36	38½	40¾	43	45¼	47½	50	52¼	54½	57	59¼	61½	65
Thickness of Flanges	2¼	2¾	2½	2⅝	2¾	2⅞	2⅞	3	3⅛	3¼	3⅜	3⅞	3⅞	3⅞	3⅞	3⅞	4

DIMENSIONS

Extra Heavy Cast Iron Flanged Fittings
250 Lbs. Steam Pressure

400 Lbs. Water Pressure

Reducing Tees and Crosses



SHORT BODY PATTERN.

Size.....	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4	4 1/2	5	6	7	8	9	10	12	14	15
*Size of Outlet and Sm. AA—Face to Face, Run A—Center to Face, Run B—Center to Face, Out.	{ All reducing fittings 1"-16" inclusive have the same center to face dimensions as straight size fittings. }																	
Size.....	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	...
*Size of Outlet and Sm. AA—Face to Face, Run A—Center to Face, Run B—Center to Face, Out.		12	14	15	16	18	18	20	20	22	24	24	26	28	28	30	32	...
		28	31	33	34	38	38	41	41	44	47	47	50	53	53	55	58	...
		14	15 1/2	16 1/2	17	19	19	20 1/2	20 1/2	22	23 1/2	23 1/2	25	26 1/2	26 1/2	27 1/2	29	...
		17	18 1/2	20	21 1/2	23	24	25 1/2	26 1/2	28	29 1/2	30 1/2	31 1/2	33 1/2	34 1/2	35 1/2	37 1/2	...

*LONG BODY PATTERNS are used when outlets are larger than given in the above table, therefor have same dimensions as straight size fittings. The dimensions of "Reducing Flanged Fittings" are always regulated by the reduction of the outlet. FITTINGS REDUCING ON THE RUN ONLY, the long body pattern will always be used except Double Sweep Tees, on which the reduced end is always longer than the regular fitting. Dimensions on request. BULL HEADS OR TEES having outlet larger than the run, will be the same length center to face of all openings as a tee with all openings of the size of the outlet, for example: a 12 x 18-inch tee will be governed by the dimensions of the 18-inch long body tee; namely 18 inches center to face of all openings and 36 inches face to face. REDUCING ELBOWS, carry same center to face dimensions as regular elbows of largest straight size.

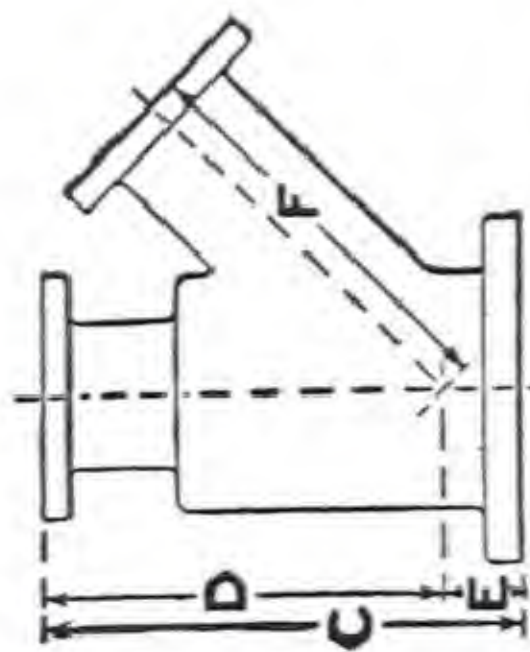
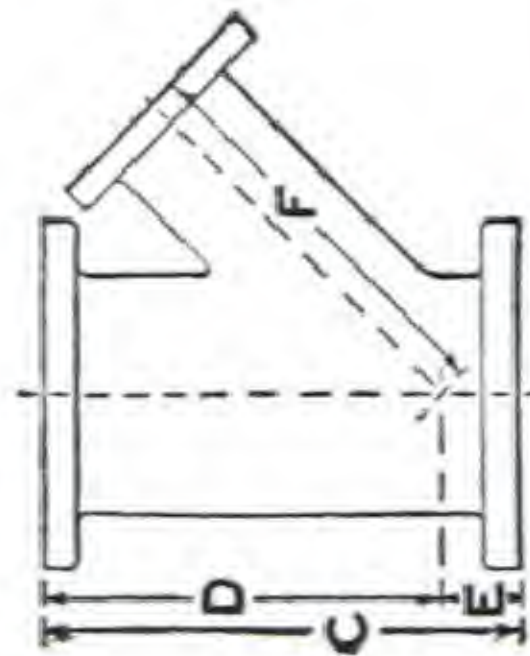
DIMENSIONS

Extra Heavy Cast Iron Flanged Fittings

250 Lbs. Steam Pressure

400 Lbs. Water Pressure

Reducing Laterals



SHORT BODY PATTERN.

Size	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4	4 1/2	5	6	7
*Size of Branch and Smaller												
C—Face to Face, Run												
D—Center to Face, Run												
E—Center to Face, Run												
F—Center to Face, Branch												
Size	8	9	10	12	14	15	16	18	20	22	24	
*Size of Branch and Smaller												
C—Face to Face, Run												
D—Center to Face, Run												
E—Center to Face, Run												
F—Center to Face, Branch												

{ All reducing fittings 1"-16" inclusive have same center to face dimensions as straight size fittings. }

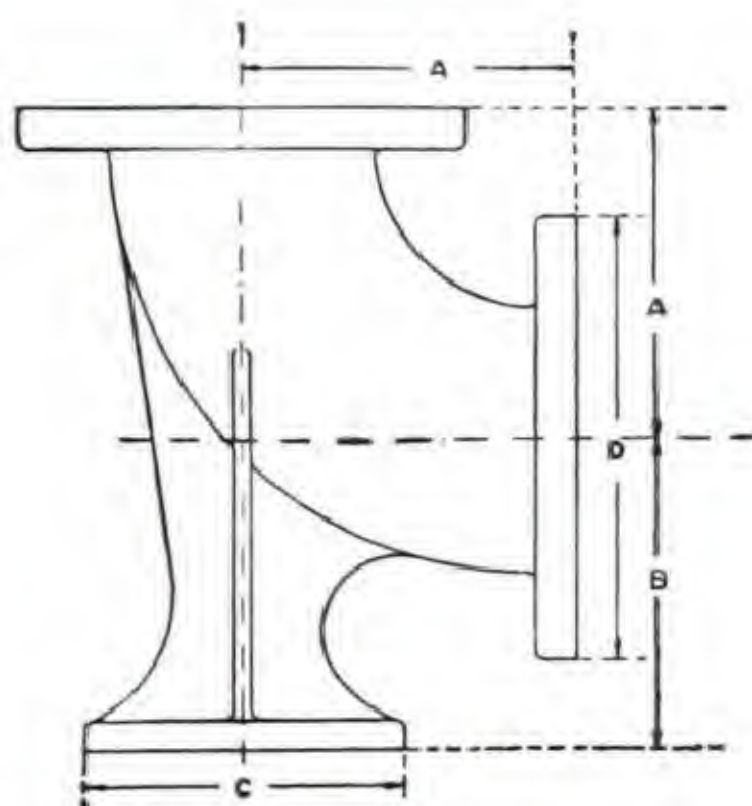
*LONG BODY PATTERNS are used when branches are larger than given in the above table, therefore have same dimensions as straight size fittings.
The dimensions of Reducing Flanged Fittings are always regulated by the reduction of the branch; fittings reducing on the run only, the long body pattern will always be used.

DIMENSIONS

Extra Heavy Cast Iron Flanged Fittings

250 Lbs. Steam Pressure

400 Lbs. Water Pressure

Base Elbows

Note:—Bases are Round and will be Drilled to Order.

Size	A	B	C	D
2	5	5 $\frac{1}{4}$	6 $\frac{1}{2}$	6 $\frac{1}{2}$
2 $\frac{1}{2}$	5 $\frac{1}{2}$	5 $\frac{3}{4}$	6 $\frac{1}{2}$	7 $\frac{1}{2}$
3	6	6 $\frac{1}{8}$	6 $\frac{1}{2}$	8 $\frac{1}{4}$
3 $\frac{1}{2}$	6 $\frac{1}{2}$	6 $\frac{1}{2}$	6 $\frac{1}{2}$	9
4	7	7	6 $\frac{1}{2}$	10
4 $\frac{1}{2}$	7 $\frac{1}{2}$	7 $\frac{1}{4}$	6 $\frac{1}{2}$	10 $\frac{1}{2}$
5	8	7 $\frac{1}{2}$	7 $\frac{1}{2}$	11
6	8 $\frac{1}{2}$	8	7 $\frac{1}{2}$	12 $\frac{1}{2}$
7	9	8 $\frac{3}{4}$	7 $\frac{1}{2}$	14
8	10	9 $\frac{1}{4}$	10	15
9	10 $\frac{1}{2}$	10	10	16 $\frac{1}{4}$
10	11 $\frac{1}{2}$	10 $\frac{1}{2}$	10	17 $\frac{1}{2}$
12	13	11	12 $\frac{1}{2}$	20 $\frac{1}{2}$
14	15	14	12 $\frac{1}{2}$	23
15	15 $\frac{1}{2}$	14 $\frac{1}{2}$	12 $\frac{1}{2}$	24 $\frac{1}{2}$
16	16 $\frac{1}{2}$	15 $\frac{1}{4}$	12 $\frac{1}{2}$	25 $\frac{1}{2}$
18	18	16	15	28

DIMENSIONS
*Templates for Drilling Extra Heavy
 Cast Iron Flanged Valves and Fittings*

American 1914 Extra Heavy Standard

Size Inches	Diameter of Flanges Inches	Thickness of Flanges Inches	Bolt Circle Inches	Number of Bolts	Size of Bolts Inches
1	4½	$\frac{11}{16}$	3¼	4	½
1¼	5	$\frac{3}{4}$	3¾	4	½
1½	6	$\frac{13}{16}$	4½	4	⅝
2	6½	$\frac{7}{8}$	5	4	⅝
2½	7½	1	5⅞	4	¾
3	8¼	1⅛	6⅝	8	¾
3½	9	1⅜	7¼	8	¾
4	10	1¼	7⅞	8	¾
4½	10½	1⅝	8½	8	¾
5	11	1⅞	9¼	8	¾
6	12½	1⅞	10⅝	12	¾
7	14	1½	11⅞	12	⅞
8	15	1⅝	13	12	⅞
9	16¼	1¾	14	12	1
10	17½	1⅞	15¼	16	1
12	20½	2	17¾	16	1⅛
14	23	2⅛	20¼	20	1⅝
15	24½	2⅜	21½	20	1¾
16	25½	2¼	22½	20	1¾
18	28	2⅞	24¾	24	1¾
20	30½	2½	27	24	1⅞
22	33	2⅝	29¼	24	1½
24	36	2¾	32	24	1⅝
26	38¼	2⅞	34½	28	1⅝
28	40¾	2⅝	37	28	1⅝
30	43	3	39¼	28	1¾
32	45¼	3⅛	41½	28	1⅞
34	47½	3¼	43½	28	1⅞
36	50	3⅜	46	32	1⅞
38	52¼	3⅞	48	32	1⅞
40	54½	3⅞	50¼	36	1⅞
42	57	3⅞	52¾	36	1⅞
44	59¼	3¾	55	36	2
46	61½	3⅞	57¼	40	2
48	65	4	60¾	40	2

These Drilling Templates are in multiples of four, so that fittings may be made to face in any quarter and bolt holes straddle the center line.

Bolt holes are drilled ⅛-inch larger than nominal diameter of bolts.

SPECIAL FLANGED FITTINGS

Standard or Extra Heavy

Iron, Steel or Brass

On the following pages we illustrate a few of the many special fittings we are called upon to furnish.

Special Castings

We are equipped to execute orders for special Cast Iron, Steel or Brass fittings. Requests for prices or orders should be accompanied by full dimensioned sketch or blueprints. This should also state whether Cast Iron, Cast Steel or Brass is required and the working pressure and service in which they will be used.

Special Fabricated Pipe Fittings

We call attention to the fittings illustrated on page 279 which are made to order from either steel or brass pipe and flanges.

These fittings for the most part can be made to the standard dimensions of cast fittings or they can be fabricated to dimensions to suit any special condition. The outlets are welded on and equipped with Screw Flanges, Lap Joint Flanges, Welded Flanges or Screw and Welded Flanges. A request for prices on any of these fittings should be accompanied by sketch giving full dimensions and a statement as to the service and working pressure for which they will be used.

SPECIAL FLANGED FITTINGS

*Special Castings**For Low Pressure, Standard or Extra Heavy Pressures*

Distributing Header



Double Lateral



Return Bend with Back Outlet



Offset



Return Bend



Tee

Showing where Tapped
Drain Bosses May
Be Located



Flanged Y



Special Angle
Elbows
 $5\frac{1}{8}^\circ$, $11\frac{1}{4}^\circ$,
 $22\frac{1}{2}^\circ$, 30° ,
 60° .



Elbow

Showing where Tapped
Drain Bosses May
Be Located

Prices on Application.

SPECIAL FLANGED FITTINGS

For Low Pressure, Standard or Extra Heavy Pressures

Fabricated From

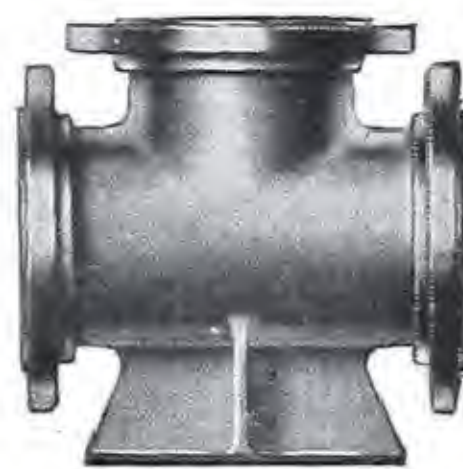
Steel or Brass Pipe and Flanges



Cross
Typical Cross Section View



Reducer



Tee
Plain or Anchorage



90° or Special
Angle Elbow



45° or Special
Angle Elbow



45° or Special
Angle Lateral



Offset



45° or Special Angle
Double Lateral

Prices on application.

See description on page 277.

CAST STEEL FLANGED FITTINGS

Explanatory Notes

SERIES 15

Series 15 (150 lb. W. S. P.) Flanged Fittings and Flanges are made to the dimensions of the 1914 American Schedule for 125 Pound Cast Iron Flanged Fittings and Flanges.

These fittings and flanges are regularly furnished with 1/16-inch raised face and with bolt holes spot faced.

See page opposite for notes on working pressures, etc.

See also dimension pages following.

NEW STANDARDS

SERIES 25, SERIES 40, SERIES 60 AND SERIES 90 FOR STEEL FLANGED FITTINGS AND FLANGES AS RECENTLY DEVELOPED UNDER THE PROCEDURE OF THE

AMERICAN ENGINEERING STANDARDS COMMITTEE

Series 25 (250 Pound W. S. P.) Cast Steel Flanged Fittings and Flanges conform to the standards developed by the American Engineering Standards Committee. These fittings are regularly furnished with 1/16-inch raised face and with bolt holes spot faced.

For List Prices see pages 295 to 303.

Series 40, 60 and 90 (400, 600, 900 Pound W. S. P.) Flanged Fittings and Flanges are made to conform to the standards developed by the American Engineering Standards Committee. These fittings are furnished with male face on Fittings, male or female face on Flanges and with bolt holes spot faced.

Tongue, Groove or Female faces on Fittings, also Tongue or Groove faces on Flanges are special. An extra charge will be made for these special facings. See pages 337 to 339.

See page opposite for notes on working pressures, etc.

See also dimensions on pages following.

For List Prices on Series 40, 60 and 90 Fittings and Flanges see pages 307 to 309, 326-A and 326-B.

SERIES 30

Series 30 (300 Pound W. S. P.) Flanged Fittings and Flanges are made to the dimensions of the new Series 25 Flanged Fittings and Flanges, except that the body thicknesses are greater. The greater body thicknesses warrant the ratings adopted. They are interchangeable with the flanged steel fittings of the former Extra Heavy Class. These fittings and flanges are regularly furnished with 1/16-inch raised face and with bolt holes spot faced.

List Prices for Series 30 Flanged Fittings and Flanges are the same as for the new Series 25.

See page opposite for Working Pressures, etc.

CAST STEEL FLANGED FITTINGS

*Working and Test Pressures**Series 15, 25, 30, 40, 60, 90 and Hydraulic*

THE SERIES 25, 40, 60 AND 90 MATERIAL
CONFORMS TO THE STANDARDS
FOR STEEL FLANGED FITTINGS AND FLANGES
AS RECENTLY DEVELOPED UNDER THE
PROCEDURE OF THE
AMERICAN ENGINEERING STANDARDS COMMITTEE

WORKING AND TEST PRESSURES

Classes	Steam or Hot Oil Working Pressure	Working Hydraulic Rating at 450 Degrees F. Such as Boiler Feed Lines Without Shock	Water, Oil, Air or Gas at not over 100 Degrees F. Without Shock	Cold Hydro- static Shell Test
	750° F.	450° F.	100° F.	
Series 15	150 lbs.	.....	300 lbs.	750 lbs.
Series 25	250 lbs.	300 lbs.	500 lbs.	750 lbs.
*Series 30	300 lbs.	350 lbs.	500 lbs.	1000 lbs.
†Series 30	350 lbs.	420 lbs.	700 lbs.	1000 lbs.
Series 40	400 lbs.	480 lbs.	750 lbs.	1000 lbs.
Series 60	600 lbs.	720 lbs.	1000 lbs.	1500 lbs.
Series 90	900 lbs.	1080 lbs.	1500 lbs.	2000 lbs.
Hydraulic	.....	.....	3000 lbs.	3000 lbs.

Ratings at temperatures higher than 750° will be given on receipt of full information regarding working conditions.

*When using Commercial Bolts.

†When using High Tensile Bolts.

CAST STEEL FLANGED FITTINGS

Series 15

Elbows

For 150 Lbs. W. S. P. at a Total Temperature of 750 Degrees



Elbow—Fig. No. 861



45° Elbow—Fig. No. 862

Size Inches	ELBOW—Fig. No. 861		45° ELBOW—Fig. No. 862	
	Faced Each	Faced, Drilled and Spot Faced Each	Faced Each	Faced, Drilled and Spot Faced Each
2	\$11.00	\$13.00	\$11.00	\$13.00
2½	13.00	15.00	13.00	15.00
3	14.00	17.00	14.00	17.00
3½	17.00	20.00	17.00	20.00
4	19.00	22.00	19.00	22.00
†4½	22.00	25.00	22.00	25.00
5	24.00	27.00	24.00	27.00
6	29.00	33.00	29.00	33.00
†7	36.00	41.00	36.00	41.00
8	43.00	48.00	43.00	48.00
10	61.00	67.00	61.00	67.00
12	77.00	84.00	77.00	84.00
14	100.00	108.00	100.00	108.00
16	130.00	140.00	130.00	140.00

The flanges of these fittings are regularly furnished with 1/16-inch raised face.

† Standard practice of manufacturers urges the discontinuance of these sizes which are considered as special.

Sizes 18, 20 and 24-inch, prices on application.

See Notes on page 280. See page 281 for pressure ratings at other temperatures.

Order by Figure Number.

CAST STEEL FLANGED FITTINGS

Series 15

Taper Reducing Elbows

For 150 Lbs. W. S. P. at a Total Temperature of 750 Degrees

Taper Reducing Elbows
Fig. No. 863

Size Inches	Faced Each	Faced, Drilled and Spot Faced Each	Size Inches	Faced Each	Faced, Drilled and Spot Faced Each
2 x 1 $\frac{1}{4}$	\$14.00	\$16.00	6x 5	\$35.00	\$39.00
2 x 1 $\frac{1}{2}$	14.00	16.00	†7x 4	43.00	48.00
2 $\frac{1}{2}$ x1 $\frac{1}{2}$	16.00	18.00	†7x 5	43.00	48.00
2 $\frac{1}{2}$ x2	16.00	18.00	†7x 6	43.00	48.00
3 x 1 $\frac{1}{2}$	17.00	20.00	8x 4	51.00	56.00
3 x 2	17.00	20.00	8x 5	51.00	56.00
3 x 2 $\frac{1}{2}$	17.00	20.00	8x 6	51.00	56.00
3 $\frac{1}{2}$ x2	21.00	24.00	8x 7	51.00	56.00
3 $\frac{1}{2}$ x2 $\frac{1}{2}$	21.00	24.00	10x 5	73.00	79.00
3 $\frac{1}{2}$ x3	21.00	24.00	10x 6	73.00	79.00
4 x 2	23.00	26.00	10x 8	73.00	79.00
4 x 2 $\frac{1}{2}$	23.00	26.00	12x 7	93.00	100.00
4 x 3	23.00	26.00	12x 8	93.00	100.00
4 x 3 $\frac{1}{2}$	23.00	26.00	12x10	93.00	100.00
5 x 2 $\frac{1}{2}$	29.00	32.00	14x 6	120.00	128.00
5 x 3	29.00	32.00	14x10	120.00	128.00
5 x 4	29.00	32.00	14x12	120.00	128.00
6 x 3	35.00	39.00	16x 8	155.00	165.00
6 x 3 $\frac{1}{2}$	35.00	39.00	16x10	155.00	165.00
6 x 4	35.00	39.00	16x12	155.00	165.00
6 x 4 $\frac{1}{2}$	35.00	39.00	16x14	155.00	165.00

The flanges of these fittings are regularly furnished with 1/16-inch raised face.

†Standard practice of manufacturers urges the discontinuance of these sizes which are considered as special.

Sizes 18, 20 and 24-inch, prices on application.

See Notes on page 280. See page 281 for pressure ratings at other temperatures.

Order by Figure Number.

CAST STEEL FLANGED FITTINGS

Series 15

Long Radius Elbows

For 150 Lbs. W. S. P. at a Total Temperature of 750 Degrees

Long Radius Elbow
Fig. No. 864

Size Inches	Faced Each	Faced, Drilled and Spot Faced Each	Radius Inches
2	\$14.00	\$17.00	5 $\frac{1}{4}$
2 $\frac{1}{2}$	16.00	19.00	5 $\frac{5}{8}$
3	18.00	22.00	6 $\frac{1}{4}$
3 $\frac{1}{2}$	22.00	26.00	6 $\frac{7}{8}$
4	25.00	29.00	7 $\frac{3}{8}$
†4 $\frac{1}{2}$	30.00	34.00	7 $\frac{3}{4}$
5	35.00	39.00	8 $\frac{1}{2}$
6	42.00	48.00	9 $\frac{5}{8}$
†7	52.00	59.00	10 $\frac{7}{8}$
8	63.00	70.00	12
10	83.00	92.00	14 $\frac{1}{8}$
12	105.00	115.00	16 $\frac{1}{2}$
14	145.00	157.00	18 $\frac{7}{8}$
16	190.00	205.00	21 $\frac{1}{4}$

The flanges of these fittings are regularly furnished with 1/16-inch raised face.

†Standard practice of manufacturers urges the discontinuance of these sizes which are considered as special.

Sizes 18, 20 and 24-inch, prices on application.

See Notes on page 280. See page 281 for pressure ratings at other temperatures.

Order by Figure Number.

CAST STEEL FLANGED FITTINGS

Series 15

Base Elbows

For 150 Lbs. W. S. P. at a Total Temperature of 750 Degrees

Square Base Elbow
Fig. No. 865Round Base Elbow
Fig. No. 866

Size Inches	BASE ELBOWS—Fig. Nos. 865, 866		
	Faced Except Base Flange Each	Faced, Drilled and Spot Faced Except Base Flange Each	Facing and Drilling Base Flange Each
4	\$28.00	\$32.00	\$3.00
†4½	33.00	37.00	3.00
5	37.00	41.00	3.00
6	44.00	50.00	3.00
†7	54.00	61.00	6.00
8	63.00	70.00	6.00
10	88.00	97.00	8.00
12	110.00	120.00	10.00
14	148.00	160.00	12.00
16	190.00	205.00	15.00

The flanges of these fittings are regularly furnished with 1/16-inch raised face.

†Standard practice of manufacturers urges the discontinuance of these sizes which are considered as special.

Sizes 18, 20 and 24-inch, prices on application.

Flanged Base Tees made to order.

See notes on page 280. See page 281 for pressure ratings at other temperatures.

Order by Figure Number.

CAST STEEL FLANGED FITTINGS

Series 15

*Double Branch Elbows—Side Outlet Fittings**For 150 Lbs. W. S. P. at a Total Temperature of 750 Degrees*

Double Branch Elbow
Fig. No. 867



Double Branch Elbow, Reducing
Fig. No. 868



Side Outlet Elbow
Fig. No. 869



Side Outlet Elbow, Reducing
Fig. No. 870



Side Outlet Tee
Fig. No. 871



Side Outlet Tee, Reducing
Fig. No. 872

The above fittings in sizes 2 to 24-inch are made to order only.
Prices on Application

Reducing Side Outlet Elbows are made reducing on the side outlet only. Orders should specify whether side outlet is to be on radial or intersecting lines.

Double Branch Elbows are made reducing on run only.

To avoid error please furnish sketch giving sizes of all openings.

See Notes on page 280. See page 281 for pressure ratings at other temperatures.

Order by Figure Number.

CAST STEEL FLANGED FITTINGS

Series 15

Tees

For 150 Lbs. W. S. P. at a Total Temperature of 750 Degrees

Tee
Fig. No. 873Tee, Reducing
Fig. No. 874

Size Inches	TEE—Fig. No. 873		TEE, RED.—Fig. No. 874	
	Faced Each	Faced, Drilled and Spot Faced Each	Faced Each	Faced, Drilled and Spot Faced Each
2	\$15.00	\$18.00	.....	.....
2½	17.00	20.00	\$19.50	\$22.50
3	19.00	23.00	22.00	26.00
3½	22.00	26.00	25.50	29.50
4	25.00	29.00	29.00	33.00
†4½	30.00	34.00	34.50	38.50
5	33.00	37.00	38.00	42.00
6	40.00	46.00	46.00	52.00
†7	49.00	56.00	56.50	63.50
8	58.00	65.00	67.00	74.00
10	81.00	90.00	93.00	102.00
12	100.00	110.00	115.00	125.00
14	135.00	147.00	156.00	168.00
16	175.00	190.00	202.00	217.00

The flanges of these fittings are regularly furnished with 1/16-inch raised face.

†Standard practice of manufacturers urges the discontinuance of these sizes which are considered as special.

Sizes 18, 20 and 24-inch, prices on application.

See Notes on page 280. See page 281 for pressure ratings at other temperatures.

Order by Figure Number.

CAST STEEL FLANGED FITTINGS

Series 15

Crosses

For 150 Lbs. W. S. P. at a Total Temperature of 750 Degrees



Cross—Fig. No. 879



Cross, Reducing—Fig. No. 880

Size Inches	CROSS—Fig. No. 879		CROSS, RED.—Fig. No. 880	
	Faced Each	Faced, Drilled and Spot Faced Each	Faced Each	Faced, Drilled and Spot Faced Each
2	\$21.00	\$25.00		
2½	25.00	29.00	\$29.00	\$33.00
3	27.00	33.00	31.00	37.00
3½	32.00	38.00	37.00	43.00
4	36.00	42.00	41.50	47.50
†4½	42.00	48.00	48.50	54.50
5	45.00	51.00	52.00	58.00
6	55.00	63.00	63.50	71.50
†7	68.00	78.00	78.00	88.00
8	81.00	91.00	93.00	103.00
10	115.00	127.00	132.00	144.00
12	145.00	160.00	167.00	182.00
14	190.00	205.00	219.00	234.00
16	245.00	265.00	282.00	302.00

The flanges of these fittings are regularly furnished with 1/16-inch raised face.

†Standard practice of manufacturers urges the discontinuance of these sizes which are considered as special.

Sizes 18, 20 and 24-inch, prices on application.

See Notes on page 280. See page 281 for pressure ratings at other temperatures.

Order by Figure Number.

CAST STEEL FLANGED FITTINGS

Series 15

*Laterals**For 150 Lbs. W. S. P. at a Total Temperature of 750 Degrees*

Lateral
Fig. No. 881



Lateral, Reducing
Fig. No. 882

Size Inches	LATERAL—Fig. No. 881		LATERAL, RED.—Fig.No.882	
	Faced Each	Faced, Drilled and Spot Faced Each	Faced Each	Faced, Drilled and Spot Faced Each
2	\$21.00	\$25.00	.....	.....
2½	25.00	29.00	\$29.00	\$33.00
3	27.00	33.00	31.00	37.00
3½	32.00	38.00	37.00	43.00
4	36.00	42.00	41.50	47.50
†4½	42.00	48.00	48.50	54.50
5	45.00	51.00	52.00	58.00
6	55.00	63.00	63.50	71.50
†7	68.00	78.00	78.00	88.00
8	81.00	91.00	93.00	103.00
10	115.00	127.00	132.00	144.00
12	145.00	160.00	167.00	182.00
14	190.00	205.00	219.00	234.00
16	245.00	265.00	282.00	302.00

The flanges of these fittings are regularly furnished with 1/16-inch raised face.

†Standard practice of manufacturers urges the discontinuance of these sizes which are considered as special.

Sizes 18, 20 and 24-inch, prices on application.

See Notes on page 280. See page 281 for pressure ratings at other temperatures.

Order by Figure Number.

CAST STEEL FLANGED FITTINGS

Series 15
Reducers

For 150 Lbs. W. S. P. at a Total Temperature of 750 Degrees

Taper Reducer
Fig. No. 883Eccentric Taper Reducer
Fig. No. 884
Price on application

TAPER REDUCER—Fig. No. 883

Size Inches	Faced Each	Faced, Drilled and Spot Faced Each	Size Inches	Faced Each	Faced, Drilled and Spot Faced Each
3 x2	\$14.00	\$17.00	8x 5	\$43.00	\$48.00
3½x2½	17.00	20.00	8x 6	43.00	48.00
4 x2	19.00	22.00	10x 4	61.00	67.00
4 x2½	19.00	22.00	10x 5	61.00	67.00
4 x3	19.00	22.00	10x 6	61.00	67.00
5 x2	24.00	27.00	10x 8	61.00	67.00
5 x2½	24.00	27.00	12x 5	77.00	84.00
5 x3	24.00	27.00	12x 6	77.00	84.00
5 x4	24.00	27.00	12x 8	77.00	84.00
6 x3	29.00	33.00	12x10	77.00	84.00
6 x3½	29.00	33.00	14x 6	100.00	108.00
6 x4	29.00	33.00	14x 8	100.00	108.00
6 x5	29.00	33.00	14x10	100.00	108.00
†7 x3	36.00	41.00	14x12	100.00	108.00
†7 x4	36.00	41.00	16x 8	130.00	140.00
†7 x5	36.00	41.00	16x10	130.00	140.00
†7 x6	36.00	41.00	16x12	130.00	140.00
8 x3	43.00	48.00	16x14	130.00	140.00
8 x4	43.00	48.00	.....	.....	.....

The flanges of these fittings are regularly furnished with 1/16-inch raised face.

†Standard practice of manufacturers urges the discontinuance of these sizes which are considered as special.

Sizes 18, 20 and 24-inch, prices on application.

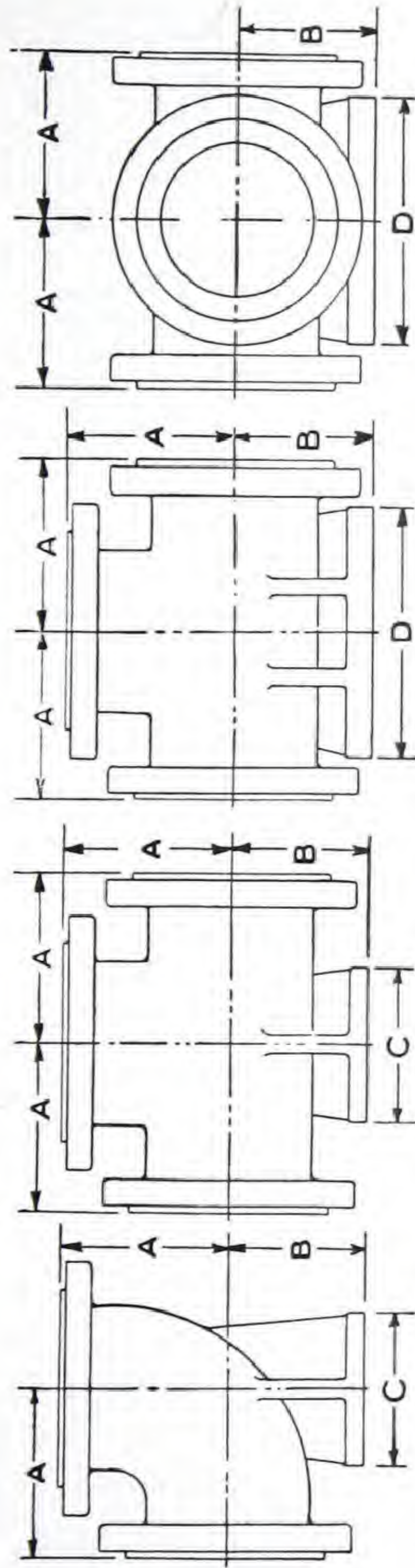
See Notes on page 280. See page 281 for pressure ratings at other temperatures.

Order by Figure Number.

DIMENSIONS

Cast Steel Flanged Fittings—Series 15 (150 Pounds W. S. P.)

Straight Sizes



Base Tee

Round or
Square Base

Square Base

Square Base

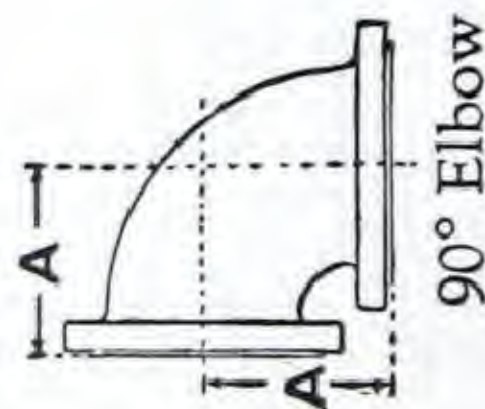
Size.....	4	6½	6½	6	9	2	4½	5	6	7	8	10	12	14	16
A—Center to Face, Elbows and Tees..... Inches	4	6½	6½	6	9	2	4½	5	6	7	8	10	12	14	16
B—Center to Face, Base Flange..... Inches	4	6½	6½	6	9	2	4½	5	6	7	8	10	12	14	15
C—Base Flg., Across flats of Sq. or diam. of Rd. In.	4	6½	6½	6	9	2	4½	5	6	7	8	10	12	14	14¾
D—Anchorage Flange, Across Flats of Square. Inches	4	6½	6½	6	9	2	4½	5	6	7	8	10	12	14	11
Size of Pipe Support for Round Base Flange... Inches	4	6½	6½	6	9	2	4½	5	6	7	8	10	12	14	23½

†Standard practice of manufacturers urges the discontinuance of these sizes which are considered as special.

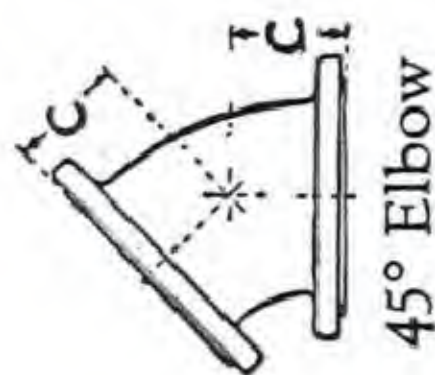
DIMENSIONS

Cast Steel Flanged Fittings—Series 15 (150 Pounds W. S. P.)

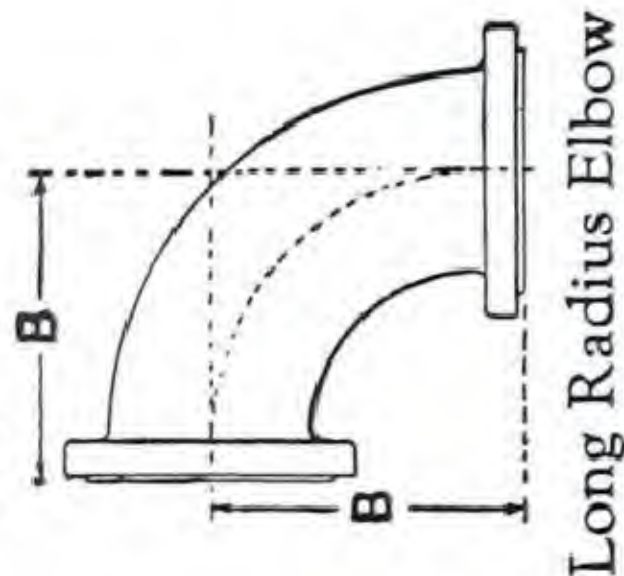
Straight Sizes



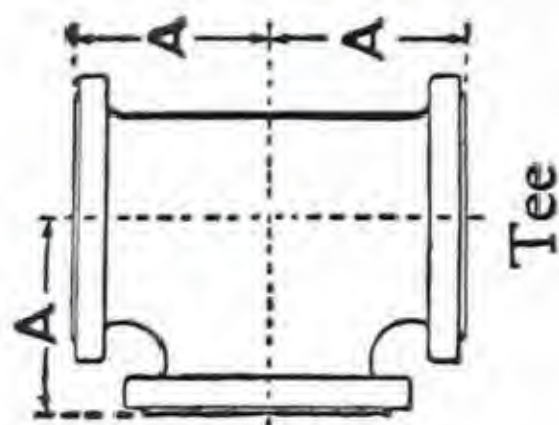
90° Elbow



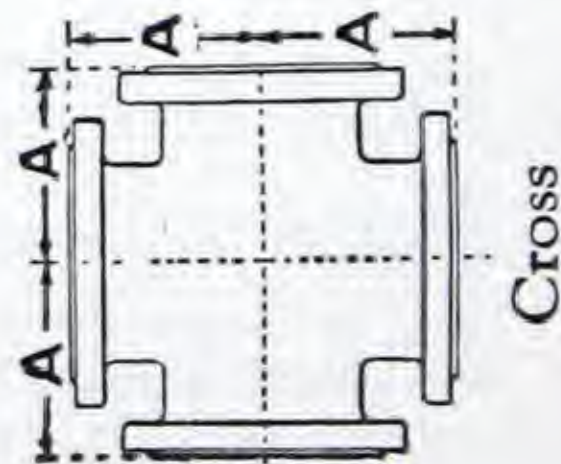
45° Elbow



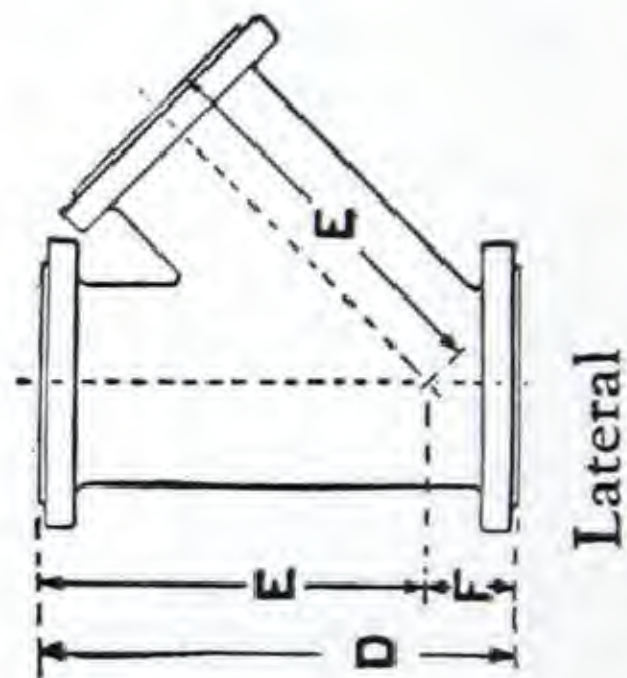
Long Radius Elbow



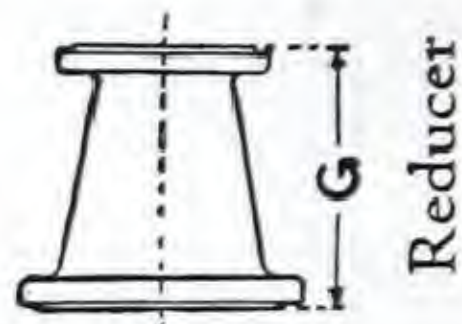
Tee



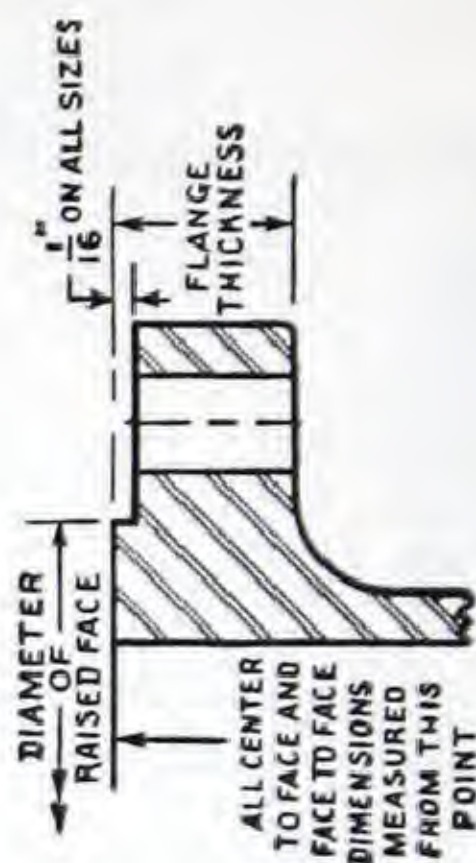
Cross



Lateral



Reducer



A 1/16-inch raised face is the standard facing for these fittings. Any other type of facing, Male, Female, Tongue or Groove, is special. See page 316.

Reducing fittings up to 16-inch have same center to face dimensions as straight size fitting of the largest opening.

For dimensions of reducing fittings, sizes 18, 20 and 24-inch, see pages 248 and 250.

†Standard practice of manufacturers urges the discontinuance of 4½ and 7-inch sizes which are considered as special.

DIMENSIONS

Cast Steel Flanged Fittings—Series 15 (150 Pounds W. S. P.)

Straight Sizes

Size.....	2	2½	3	3½	4	4½	5	6	7
Inside Diameter of Port.....	Inches	2½	3	3½	4	4½	5	6	7
AA—Face to Face, Tees and Crosses.....	Inches	2	3	3½	4	4½	5	6	7
A—Center to Face, Ells, Tees, Crosses.....	Inches	9	11	12	13	14	15	16	17
B—Center to Face, L. R. Ells.....	Inches	4½	5½	6	6½	7	7½	8	8½
C—Center to Face, 45° Ells.....	Inches	6½	7¾	8½	9	9½	10¼	11½	12¾
D—Face to Face, Laterals.....	Inches	2½	3	3½	4	4½	5	6	7
E—Center to Face, Laterals.....	Inches	10½	12	13	14½	15½	17	18	20½
F—Center to Face, Laterals.....	Inches	8	9½	10	11½	12½	13½	14½	16½
G—Face to Face, Reducers.....	Inches	2½	2½	3	3	3	3½	3½	4
Diameter of Flanges.....	Inches	7	7	6½	6½	7½	8	9	10
Thickness of Flanges.....	Inches	6	7	8½	9	9½	10	11	12½
Number of Bolts.....	Inches	4	4	4	4	8	8	8	11½
Size of Bolt Holes.....	Inches	4¾	5½	6	7	7¾	8	8	8
Diameter of Bolt Circle.....	Inches	4¾	5½	6	7	7¾	8	8	10¾

Size.....	8	10	12	14-O.D.	16-O.D.	18-O.D.	20-O.D.	24-O.D.	.....
Inside Diameter of Port.....	Inches	10	12	14	16	18	20	24	.....
AA—Face to Face, Tees and Crosses.....	Inches	8	12	14	16	18	20	24	.....
A—Center to Face, Ells, Tees, Crosses.....	Inches	18	24	28	30	33	36	44	.....
B—Center to Face, L. R. Ells.....	Inches	9	11	14	15	16½	18	22	.....
C—Center to Face, 45° Ells.....	Inches	14	16½	19	24	26½	29	34	.....
D—Face to Face, Laterals.....	Inches	5½	6½	7½	8	8½	9½	11	.....
E—Center to Face, Laterals.....	Inches	22	25½	30	36½	39	43	49½	.....
F—Center to Face, Laterals.....	Inches	17½	20½	24½	30	32	35	40½	.....
G—Face to Face, Reducers.....	Inches	4½	5	5½	6½	7	8	9	.....
Diameter of Flanges.....	Inches	11	12	14	18	19	20	24	.....
Thickness of Flanges.....	Inches	13½	16	19	23½	25	27½	32	.....
Number of Bolts.....	Inches	1½	1½	1¼	1¾	1¾	1¾	1¾	.....
Size of Bolt Holes.....	Inches	8	12	12	16	16	20	20	.....
Diameter of Bolt Circle.....	Inches	11¾	14¼	17	21¼	22¾	25	29½	.....

CAST STEEL FLANGED FITTINGS

Explanatory Notes

NEW STANDARDS

SERIES 25, 40, 60 AND 90

FOR STEEL FLANGED FITTINGS AND FLANGES

AS RECENTLY DEVELOPED UNDER THE

PROCEDURE OF THE

AMERICAN ENGINEERING STANDARDS COMMITTEE

On the following pages we illustrate and give List Prices and dimensions on the Series 25, 40, 60 and 90 Cast Steel Flanged Fittings as developed under the procedure of the American Engineering Standards Committee.

Series 25 (250 Pound W. S. P.) Cast Steel Flanged Fittings and Flanges are regularly furnished with 1/16-inch raised face and with bolt holes spot faced.

Series 40, 60 and 90 (400, 600, 900 Pound W. S. P.) Flanged Fittings and Flanges are regularly furnished with male face on Fittings, male or female face on Flanges and with bolt holes spot faced.

Tongue, Groove or Female faces on Fittings, also Tongue or Groove faces on Flanges are special. An extra charge will be made for these special facings. See Pages 337 to 339.

See page 281 for notes on working pressures, etc.

See also dimensions on pages following.

For List Prices on Series 40, 60 and 90 Cast Steel Flanges, see pages 326-A and 326-B.

SERIES 30

Series 30 (300 Pound W. S. P.) Flanged Fittings and Flanges are made to the dimensions of the new Series 25 Flanged Fittings and Flanges, except that the body thicknesses are greater. The greater body thicknesses warrant the ratings adopted. They are interchangeable with the flanged steel fittings of the former Extra Heavy Class. These fittings and flanges are regularly furnished with 1/16-inch raised face and with bolt holes spot faced.

List Prices for Series 30 Flanged Fittings and Flanges are the same as for the new Series 25.

See page 281 for Working Pressures, etc.

CAST STEEL FLANGED FITTINGS

Series 25

Elbows

For 250 Lbs. W. S. P. at a Total Temperature of 750 Degrees

Elbow
Fig. No. 88545° Elbow
Fig. No. 886

Size Inches	ELBOW—Fig. No. 885		45° ELBOW—Fig. No. 886	
	Faced Each	Faced, Drilled and Spot Faced Each	Faced Each	Faced, Drilled and Spot Faced Each
†1¼	\$ 9.00	\$11.00	\$ 9.00	\$11.00
1½	10.00	12.00	10.00	12.00
2	11.00	13.00	11.00	13.00
2½	13.00	15.00	13.00	15.00
3	14.00	17.00	14.00	17.00
3½	17.00	20.00	17.00	20.00
4	19.00	22.00	19.00	22.00
†4½	22.00	25.00	22.00	25.00
5	24.00	27.00	24.00	27.00
6	29.00	33.00	29.00	33.00
†7	36.00	41.00	36.00	41.00
8	43.00	48.00	43.00	48.00
10	61.00	67.00	61.00	67.00
12	77.00	84.00	77.00	84.00
14	100.00	108.00	100.00	108.00
16	130.00	140.00	130.00	140.00
18	170.00	180.00	170.00	180.00
20	210.00	225.00	210.00	225.00
24	335.00	355.00	335.00	355.00

The flanges of these fittings are regularly furnished with 1/16-inch raised face.

†Standard practice of manufacturers urges the discontinuance of these sizes which are considered as special.

See Notes on pages 280 and 294. See page 281 for pressure ratings at other temperatures.

Order by Figure Number.

CAST STEEL FLANGED FITTINGS

Series 25

Taper Reducing Elbows

For 250 Lbs. W. S. P. at a Total Temperature of 750 Degrees



Taper Reducing Elbow—Fig. No. 887

Size Inches	Faced Each	Faced, Drilled and Spot Faced Each	Size Inches	Faced Each	Faced, Drilled and Spot Faced Each
2 x 1 1/4	\$14.00	\$16.00	6x 5	\$35.00	\$39.00
2 x 1 1/2	14.00	16.00	†7x 4	43.00	48.00
2 1/2 x 1 1/2	16.00	18.00	†7x 5	43.00	48.00
2 1/2 x 2	16.00	18.00	†7x 6	43.00	48.00
3 x 1 1/2	17.00	20.00	8x 4	51.00	56.00
3 x 2	17.00	20.00	8x 5	51.00	56.00
3 x 2 1/2	17.00	20.00	8x 6	51.00	56.00
3 1/2 x 2	21.00	24.00	8x 7	51.00	56.00
3 1/2 x 2 1/2	21.00	24.00	10x 5	73.00	79.00
3 1/2 x 3	21.00	24.00	10x 6	73.00	79.00
4 x 2	23.00	26.00	10x 8	73.00	79.00
4 x 2 1/2	23.00	26.00	12x 7	93.00	100.00
4 x 3	23.00	26.00	12x 8	93.00	100.00
4 x 3 1/2	23.00	26.00	12x 10	93.00	100.00
5 x 2 1/2	29.00	32.00	14x 6	120.00	128.00
5 x 3	29.00	32.00	14x 10	120.00	128.00
5 x 4	29.00	32.00	14x 12	120.00	128.00
6 x 3	35.00	39.00	16x 8	155.00	165.00
6 x 3 1/2	35.00	39.00	16x 10	155.00	165.00
6 x 4	35.00	39.00	16x 12	155.00	165.00
6 x 4 1/2	35.00	39.00	16x 14	155.00	165.00

The flanges of these fittings are regularly furnished with 1/16-inch raised face.

†Standard practice of manufacturers urges the discontinuance of these sizes which are considered as special.

See Notes on pages 280 and 294. See page 281 for pressure ratings at other temperatures.

Order by Figure Number.

CAST STEEL FLANGED FITTINGS

Series 25

Long Radius Elbows

For 250 Lbs. W. S. P. at a Total Temperature of 750 Degrees

Long Radius Elbow
Fig. No. 888

Size Inches	Faced Each	Faced, Drilled and Spot Faced Each	Radius Inches
2	\$14.00	\$17.00	5 $\frac{1}{4}$
2 $\frac{1}{2}$	16.00	19.00	5 $\frac{5}{8}$
3	18.00	22.00	6 $\frac{1}{4}$
3 $\frac{1}{2}$	22.00	26.00	6 $\frac{7}{8}$
4	25.00	29.00	7 $\frac{3}{8}$
†4 $\frac{1}{2}$	30.00	34.00	7 $\frac{3}{4}$
5	35.00	39.00	8 $\frac{1}{2}$
6	42.00	48.00	9 $\frac{5}{8}$
†7	52.00	59.00	10 $\frac{7}{8}$
8	63.00	70.00	12
10	83.00	92.00	14 $\frac{1}{8}$
12	105.00	115.00	16 $\frac{1}{2}$
14	145.00	157.00	18 $\frac{7}{8}$
16	190.00	205.00	21 $\frac{1}{4}$

The flanges of these fittings are regularly furnished with 1/16-inch raised face.

†Standard practice of manufacturers urges the discontinuance of these sizes which are considered as special.

See Notes on pages 280 and 294. See page 281 for pressure ratings at other temperatures.

Order by Figure Number.

CAST STEEL FLANGED FITTINGS

Series 25

Base Elbows

For 250 Lbs. W. S. P. at a Total Temperature of 750 Degrees

Square Base Elbow
Fig. No. 889Round Base Elbow
Fig. No. 890

Size Inches	BASE ELBOWS—Fig. Nos. 889, 890		
	Faced, Except Base Flange Each	Faced, Drilled and Spot Faced Except Base Flange Each	Facing, Drilling and Spot Facing Base Flange
4	\$28.00	\$32.00	\$3.00
†4½	33.00	37.00	3.00
5	37.00	41.00	3.00
6	44.00	50.00	3.00
†7	54.00	61.00	6.00
8	63.00	70.00	6.00
10	88.00	97.00	8.00
12	110.00	120.00	10.00
14	148.00	160.00	12.00
16	190.00	205.00	15.00

The flanges of these fittings are regularly furnished with 1/16-inch raised face.

†Standard practice of manufacturers urges the discontinuance of these sizes which are considered as special.

Sizes 18, 20 and 24-inch, prices on application.

Flanged Base Tees made to order.

See Notes on pages 280 and 294. See page 281 for pressure ratings at other temperatures.

Order by Figure Number.

CAST STEEL FLANGED FITTINGS

Series 25

*Double Branch Elbows—Side Outlet Fittings**For 250 Lbs. W. S. P. at a Total Temperature of 750 Degrees*Double Branch Elbow
Fig. No. 891Double Branch Elbow Reducing
Fig. No. 892Side Outlet Elbow
Fig. No. 893Side Outlet Elbow Reducing
Fig. No. 894Side Outlet Tee
Fig. No. 895Side Outlet Tee Reducing
Fig. No. 896

The above fittings in sizes 2 to 24-inch are made to order only.
Prices on Application

Reducing Side Outlet Elbows are made reducing on the side outlet only.
Orders should specify whether side outlet is to be on radial or intersecting lines.

Double Branch Elbows are made reducing on run only.
To avoid error please furnish sketch giving sizes of all openings.
See Notes on pages 280 and 294. See page 281 for pressure ratings at other temperatures.
Order by Figure Number.

CAST STEEL FLANGED FITTINGS

Series 25

Tees

For 250 Lbs. W. S. P. at a Total Temperature of 750 Degrees



Tee—Fig. No. 897



Tee, Reducing—Fig. No. 898

Size Inches	TEE—Fig. No. 897		TEE, RED.—Fig. No. 898	
	Faced Each	Faced, Drilled and Spot Faced Each	Faced Each	Faced, Drilled and Spot Faced Each
†1¼	\$13.00	\$16.00	.....	.....
1½	14.00	17.00	.....	.....
2	15.00	18.00	\$17.25	\$20.25
2½	17.00	20.00	19.50	22.50
3	19.00	23.00	22.00	26.00
3½	22.00	26.00	25.50	29.50
4	25.00	29.00	29.00	33.00
†4½	30.00	34.00	34.50	38.50
5	33.00	37.00	38.00	42.00
6	40.00	46.00	46.00	52.00
†7	49.00	56.00	56.50	63.50
8	58.00	65.00	67.00	74.00
10	81.00	90.00	93.00	102.00
12	100.00	110.00	115.00	125.00
14	135.00	147.00	156.00	168.00
16	175.00	190.00	202.00	217.00
18	230.00	245.00	265.00	280.00
20	300.00	320.00	345.00	365.00
24	460.00	490.00	530.00	560.00

The flanges of these fittings are regularly furnished with 1/16-inch raised face.

†Standard practice of manufacturers urges the discontinuance of these sizes which are considered as special.

See Notes on pages 280 and 294. See page 281 for pressure ratings at other temperatures.

Order by Figure Number.

CAST STEEL FLANGED FITTINGS

Series 25

Crosses

For 250 Lbs. W. S. P. at a Total Temperature of 750 Degrees

Cross
Fig. No. 903Cross, Reducing
Fig. No. 904

Size Inches	CROSS—Fig. No. 903		CROSS, RED.—Fig. No. 904	
	Faced Each	Faced, Drilled and Spot Faced Each	Faced Each	Faced, Drilled and Spot Faced Each
†1¼	\$17.00	\$21.00	.....	.....
1½	19.00	23.00	.....	.....
2	21.00	25.00	\$24.25	\$28.25
2½	25.00	29.00	29.00	33.00
3	27.00	33.00	31.00	37.00
3½	32.00	38.00	37.00	43.00
4	36.00	42.00	41.50	47.50
†4½	42.00	48.00	48.50	54.50
5	45.00	51.00	52.00	58.00
6	55.00	63.00	63.50	71.50
†7	68.00	78.00	78.00	88.00
8	81.00	91.00	93.00	103.00
10	115.00	127.00	132.00	144.00
12	145.00	160.00	167.00	182.00
14	190.00	205.00	219.00	234.00
16	245.00	265.00	282.00	302.00
18	320.00	340.00	368.00	388.00
20	400.00	430.00	460.00	490.00
24	635.00	675.00	730.00	770.00

The flanges of these fittings are regularly furnished with $\frac{1}{16}$ -inch raised face.

†Standard practice of manufacturers urges the discontinuance of these sizes which are considered as special.

See Notes on pages 280 and 294. See page 281 for pressure ratings at other temperatures.

Order by Figure Number.

CAST STEEL FLANGED FITTINGS

Series 25

Laterals

For 250 Lbs. W. S. P. at a Total Temperature of 750 Degrees



Lateral—Fig. No. 905



Lateral, Reducing—Fig. No. 906

Size Inches	LATERAL—Fig. No. 905		LATERAL, RED.—Fig. No. 906	
	Faced Each	Faced, Drilled and Spot Faced Each	Faced Each	Faced, Drilled and Spot Faced Each
2	\$21.00	\$25.00	.....	.....
2½	25.00	29.00	.....	.....
3	27.00	33.00	.....	.....
3½	32.00	38.00	.....	.....
4	36.00	42.00	\$41.50	\$47.50
†4½	42.00	48.00	48.50	54.50
5	45.00	51.00	52.00	58.00
6	55.00	63.00	63.50	71.50
†7	68.00	78.00	78.00	88.00
8	81.00	91.00	93.00	103.00
10	115.00	127.00	132.00	144.00
12	145.00	160.00	167.00	182.00
14	190.00	205.00	219.00	234.00
16	245.00	265.00	282.00	302.00
18	320.00	340.00	368.00	388.00
20	400.00	430.00	.....	.....
24	635.00	675.00	.....	.....

The flanges of these fittings are regularly furnished with 1/16-inch raised face.

†Standard practice of manufacturers urges the discontinuance of these sizes which are considered as special.

See Notes on pages 280 and 294. See page 281 for pressure ratings for other temperatures.

Order by Figure Number.

CAST STEEL FLANGED FITTINGS

Series 25

Reducers

For 250 Lbs. W. S. P. at a Total Temperature of 750 Degrees

Taper Reducer
Fig. No. 907Eccentric Taper Reducer
Fig. No. 908
Price on application

TAPER REDUCER — Fig. No. 907

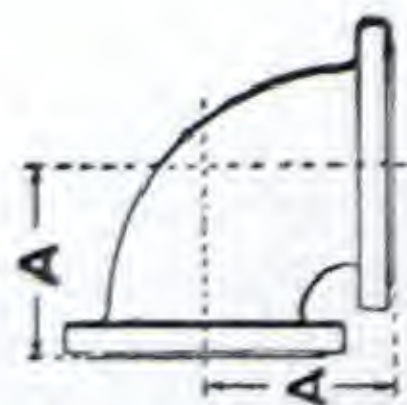
Size Inches	Faced Each	Faced, Drilled and Spot Faced Each	Size Inches	Faced Each	Faced, Drilled and Spot Faced Each
3 x2	\$14.00	\$17.00	8x 5	\$43.00	\$48.00
3½x2½	17.00	20.00	8x 6	43.00	48.00
4 x2	19.00	22.00	10x 4	61.00	67.00
4 x2½	19.00	22.00	10x 5	61.00	67.00
4 x3	19.00	22.00	10x 6	61.00	67.00
5 x2	24.00	27.00	10x 8	61.00	67.00
5 x2½	24.00	27.00	12x 5	77.00	84.00
5 x3	24.00	27.00	12x 6	77.00	84.00
5 x4	24.00	27.00	12x 8	77.00	84.00
6 x3	29.00	33.00	12x10	77.00	84.00
6 x3½	29.00	33.00	14x 6	100.00	108.00
6 x4	29.00	33.00	14x 8	100.00	108.00
6 x5	29.00	33.00	14x10	100.00	108.00
†7 x3	36.00	41.00	14x12	100.00	108.00
†7 x4	36.00	41.00	16x 8	130.00	140.00
†7 x5	36.00	41.00	16x10	130.00	140.00
†7 x6	36.00	41.00	16x12	130.00	140.00
8 x3	43.00	48.00	16x14	130.00	140.00
8 x4	43.00	48.00	....	....	....

The flanges of these fittings are regularly furnished with $\frac{1}{16}$ -inch raised face.
 †Standard practice of manufacturers urges the discontinuance of these sizes which are considered as special.

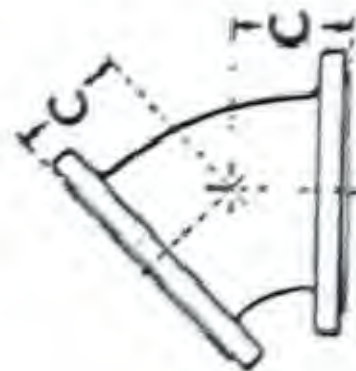
See Notes on pages 280 and 294. See page 281 for pressure ratings at other temperatures.

Order by Figure Number.

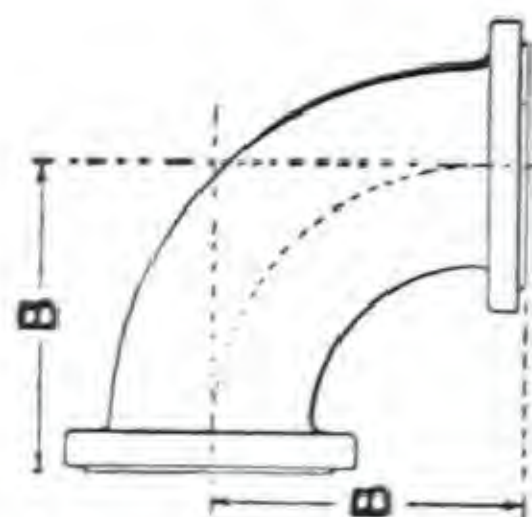
DIMENSIONS Cast Steel Flanged Fittings—Series 25 (250 Pounds W. S. P.) Straight Sizes



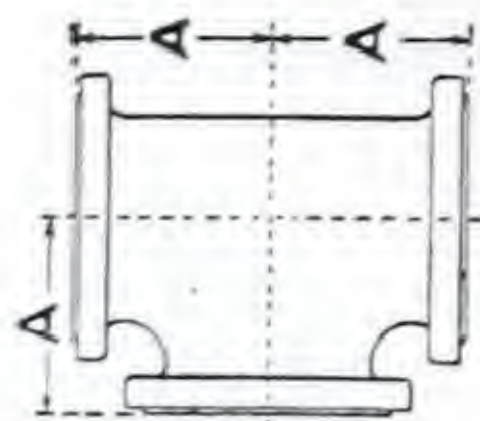
90° Elbow



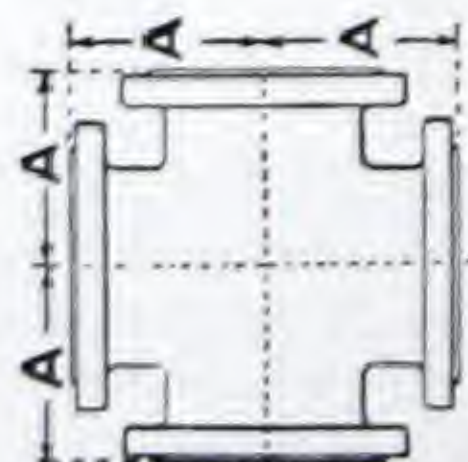
45° Elbow



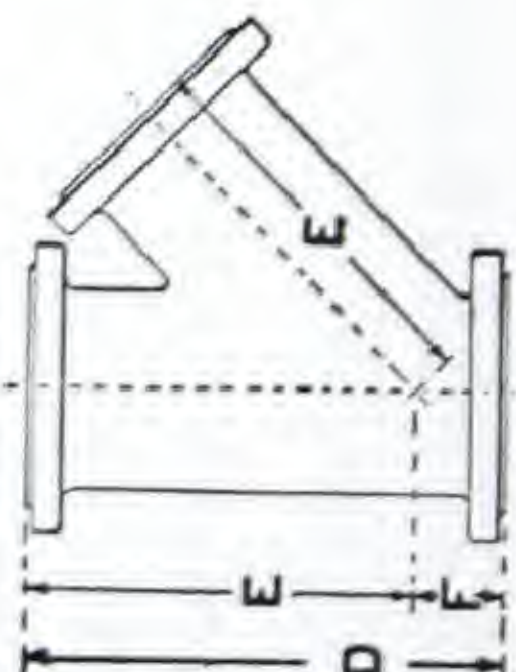
Long Radius Elbow



Tee



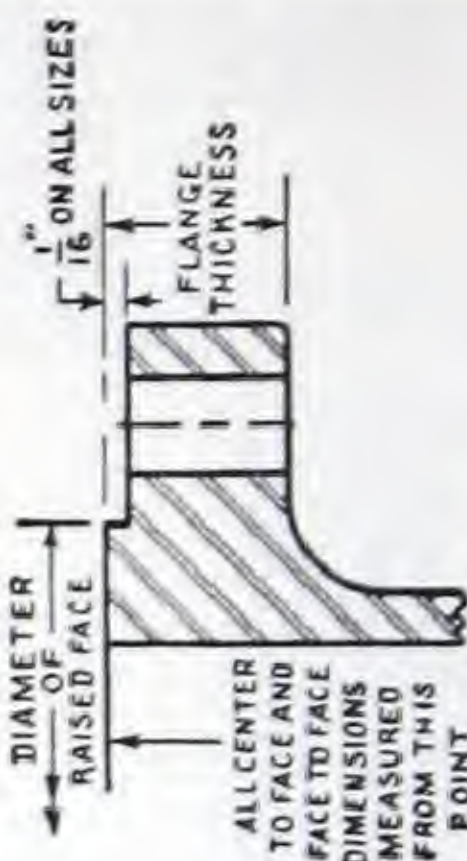
Cross



Lateral



Reducer



A $\frac{1}{16}$ -inch raised face is the standard facing for these fittings. Any other type of facing, Male, Female, Tongue or Groove, is special. See page 316.

†Standard practice of manufacturers urges the discontinuance of 1 $\frac{1}{4}$, 4 $\frac{1}{2}$ and 7-inch sizes which are considered as special.

Reducing fittings up to 16-inch have same Center to Face dimensions as straight size fittings of the largest opening. For dimensions of reducing fittings, sizes 18, 20 and 24-inch, see pages 273 and 274.

DIMENSIONS

Cast Steel Flanged Fittings—Series 25 (250 Pounds W. S. P.)

Straight Sizes

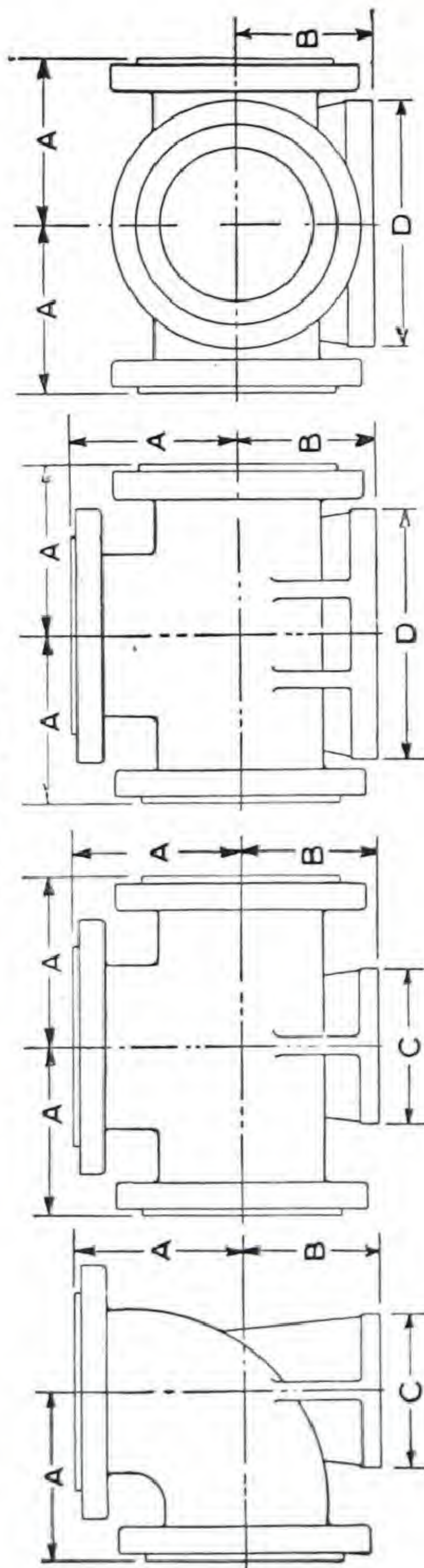
Size.....	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4	4 1/2	5	6
Inside Diameter of Port.....	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4	4 1/2	5	6
AA-Face to Face, Tees and Crosses.....	8 1/2	9	10	11	12	13	14	15	16	17
A-Center to Face, Ells, Tees, Crosses.....	4 1/4	4 1/2	5	5 1/2	6	6 1/2	7	7 1/2	8	8 1/2
B-Center to Face, L. R. Ells.....	2 1/2	2 3/4	3	3 1/2	3 3/4	4	4 1/2	4 3/4	5	5 1/2
C-Center to Face, 45° Ells.....	2 1/2	2 3/4	3	3 1/2	3 3/4	4	4 1/2	4 3/4	5	5 1/2
D-Face to Face, Laterals.....	2 1/2	2 3/4	3	3 1/2	3 3/4	4	4 1/2	4 3/4	5	5 1/2
E-Center to Face, Laterals.....	2 1/2	2 3/4	3	3 1/2	3 3/4	4	4 1/2	4 3/4	5	5 1/2
F-Center to Face, Laterals.....	2 1/2	2 3/4	3	3 1/2	3 3/4	4	4 1/2	4 3/4	5	5 1/2
G-Face to Face, Reducers.....	2 1/2	2 3/4	3	3 1/2	3 3/4	4	4 1/2	4 3/4	5	5 1/2
Diameter of Flanges.....	5	6	6 1/2	7 1/2	8 1/4	9	10	10 1/2	11	12 1/2
Thickness of Flanges.....	3/4	13/16	7/8	1	1 1/8	1 3/16	1 1/4	1 5/16	1 3/8	1 7/16
Number of Bolts.....	4	4	4	4	8	8	8	8	8	12
Size of Bolt Holes.....	5/8	3/4	3/4	7/8	7/8	7/8	7/8	7/8	7/8	7/8
Diameter of Bolt Circle.....	3 3/4	4 1/2	5	5 7/8	6 5/8	7 1/4	7 7/8	8 1/2	9 1/4	10 5/8

Size.....	7	8	10	12	14-O.D.	16-O.D.	18-O.D.	20-O.D.	24-O.D.	....
Inside Diameter of Port.....	7	8	10	12	13 1/4	15 1/4	17	19	23	....
AA-Face to Face, Tees and Crosses.....	18	20	23	26	30	33	36	39	45	....
A-Center to Face, Ells, Tees, Crosses.....	9	10	11 1/2	13	15	16 1/2	18	19 1/2	22 1/2	....
B-Center to Face, L. R. Ells.....	12 3/4	14	16 1/2	19	21 1/2	24	26 1/2	29	34	....
C-Center to Face, 45° Ells.....	6	6	7	8	8 1/2	9 1/2	10	10 1/2	12	....
D-Face to Face, Laterals.....	23 1/2	25 1/2	29 1/2	33 1/2	37 1/2	42	45 1/2	49	57 1/2	....
E-Center to Face, Laterals.....	19	20 1/2	24	27 1/2	31	34 1/2	37 1/2	40 1/2	47 1/2	....
F-Center to Face, Laterals.....	4 1/2	5	5 1/2	6	6 1/2	7 1/2	8	8 1/2	10	....
G-Face to Face, Reducers.....	10	11	12	14	16	18	19	20	24	....
Diameter of Flanges.....	14	15	17 1/2	20 1/2	23	25 1/2	28	30 1/2	36	....
Thickness of Flanges.....	1 1/2	1 5/8	1 7/8	2	2 1/8	2 1/4	2 3/8	2 1/2	2 3/4	....
Number of Bolts.....	12	12	16	16	20	20	24	24	24	....
Size of Bolt Holes.....	1	1	1 1/8	1 1/4	1 1/4	1 3/8	1 3/8	1 1/2	1 3/4	....
Diameter of Bolt Circle.....	11 7/8	13	15 1/4	17 3/4	20 1/4	22 1/2	24 3/4	27	32	....

DIMENSIONS

Cast Steel Flanged Fittings—Series 25 (250 Pounds W. S. P.)

Straight Sizes



Base Elbow Base Tee Anchorage Tees

Round or Square Base Round or Square Base Square Base

Size.....	4	5	6	7	8	10	12	14	16
A—Center to Face, Ells and Tees.....	Inches	7 1/2	8 1/2	9 1/2	10 1/2	11 1/2	13	15	16 1/2
B—Center to Face, Base Flange.....	Inches	7 1/4	8 1/4	9 1/4	10 1/4	11 1/4	13 1/2	15 1/2	16 1/4
C—Base Flange—Across flats of Sq. or diam of Rd. Inches	Inches	6 1/2	7 1/2	8 1/2	9 1/2	10 1/2	12 1/2	14 1/2	15 1/2
D—Anchorage Flange, Across Flats of Square.....	Inches	10	11	12 1/2	14	15	17	19	22 1/2
Size of Pipe Support for Round Base Flange.....	Inches	2	2 1/2	2 1/2	2 1/2	4	6	6	6

†Standard practice of manufacturers urges the discontinuance of these sizes which are considered as special.

CAST STEEL FLANGED FITTINGS

Series 40 (400 Pounds W. S. P.)

For 400 Lbs. W. S. P. at a Total Temperature of 750 Degrees

LIST PRICES

Size, Inches	90° ELBS. No. 931	45° ELBS. No. 932	BASE ELBOWS Fig. No. 935		TEES		CROSSES		LATERALS	
	Faced, Drilled and Spot Faced Each	Faced, Drilled and Spot Faced Each	Faced, Drilled and Spot Faced Except Base Flange Each	Facing, Drilling and Spot Faced Base Flange Each	Str. No. 936 Faced, Drilled and Spot Faced Each	Red. No. 937 Faced, Drilled and Spot Faced Each	Str. No. 938 Faced, Drilled and Spot Faced Each	Red. No. 939 Faced, Drilled and Spot Faced Each	Str. No. 940 Faced, Drilled and Spot Faced Each	Red. No. 941 Faced, Drilled and Spot Faced Each
2	Use		.....	.....	Use Series 60 for Sizes 3½" and under					
2½	Series 60		.....	.....				
3	for sizes 3½"		.....	.....				
3½	and under		.....	.....				
4	31.00	31.00	44.75	4.00	45.50	51.50	63.00	71.50	63.00	71.50
4½	36.00	36.00	52.00	4.00	51.00	58.00	71.00	81.00	71.00	81.00
5	40.00	40.00	59.50	4.00	57.00	65.00	79.00	90.00	79.00	90.00
6	48.00	48.00	71.50	4.00	68.00	77.00	94.00	107.00	94.00	107.00
7	60.00	60.00	88.00	8.00	85.00	96.00	118.00	134.00	118.00	134.00
8	72.00	72.00	104.00	8.00	101.00	115.00	141.00	160.00	141.00	160.00
10	100.00	100.00	142.00	10.75	141.00	160.00	196.00	223.00	196.00	223.00
12	133.00	133.00	187.00	13.25	187.00	213.00	260.00	296.00	260.00	296.00
14	175.00	175.00	249.00	16.00	247.00	281.00	344.00	392.00	344.00	392.00
16	230.00	230.00	326.00	20.00	324.00	369.00	452.00	515.00	452.00	515.00
18	290.00	290.00	.....	.....	409.00	466.00	570.00	650.00	570.00	650.00
20	370.00	370.00	.....	.....	521.00	594.00	728.00	830.00	728.00	.....
24	565.00	565.00	.....	.....	795.00	908.00	1110.00	1268.00	1110.00	.....

Size, Inches	RED. ELBOWS No. 933	TAPER RED. No. 942	Size, Inches	RED. ELBOWS No. 933	TAPER RED. No. 942	Size, Inches	RED. ELBOWS No. 933	TAPER RED. No. 942
	Faced, Drilled and Spot Faced Each	Faced, Drilled and Spot Faced Each		Faced, Drilled and Spot Faced Each	Faced, Drilled and Spot Faced Each		Faced, Drilled and Spot Faced Each	Faced, Drilled and Spot Faced Each
3 x2	.....	Use	6x5	57.00	48.00	12x 5	.....	133.00
3½x2½	.....	Series 60	7x3	.....	60.00	12x 6	.....	133.00
4 x2	37.00	31.00	7x4	71.00	60.00	12x 7	160.00	.....
4 x2½	37.00	31.00	7x5	71.00	60.00	12x 8	160.00	133.00
4 x3	37.00	31.00	7x6	71.00	60.00	12x10	160.00	133.00
4 x3½	37.00	.....	8x3	.....	72.00	14x 6	210.00	175.00
5 x2	.....	40.00	8x4	85.00	72.00	14x 8	.....	175.00
5 x2½	47.00	40.00	8x5	85.00	72.00	14x10	210.00	175.00
5 x3	47.00	40.00	8x6	85.00	72.00	14x12	210.00	175.00
5 x4	47.00	40.00	8x7	85.00	.....	16x 8	275.00	230.00
6 x3	57.00	48.00	10x4	.....	100.00	16x10	275.00	230.00
6 x3½	57.00	48.00	10x5	120.00	100.00	16x12	275.00	230.00
6 x4	57.00	48.00	10x6	120.00	100.00	16x14	275.00	230.00
6 x4½	57.00	.....	10x8	120.00	100.00	.....	.....	.....

The flanges of these fittings are regularly furnished with ¼-inch raised face.

†Standard practice of manufacturers urges the discontinuance of these sizes which are considered special.

See Notes on pages 280 and 294. See page 281 for pressure ratings at other temperatures.

Order by Figure Number.

CAST STEEL FLANGED FITTINGS

Series 60 (600 Pounds W. S. P.)

For 600 Lbs. W. S. P. at a Total Temperature of 750 Degrees

LIST PRICES

Size Inches	90° ELBS. No. 951	45° ELBS. No. 952	BASE ELBOWS Fig. No. 955		TEES		CROSSES		LATERALS	
	Faced, Drilled and Spot Faced Each	Faced, Drilled and Spot Faced Each	Faced, Drilled and Spot Faced, Except Base Flange Each	Facing, Drilling and Spot Facing Base Flange Each	Str. No. 956 Faced, Drilled and Spot Faced Each	Red. No. 957 Faced, Drilled and Spot Faced Each	Str. No. 958 Faced, Drilled and Spot Faced Each	Red. No. 959 Faced, Drilled and Spot Faced Each	Str. No. 960 Faced, Drilled and Spot Faced Each	Red. No. 961 Faced, Drilled and Spot Faced Each
3/4	13.00	.....	.....	.....	19.00	.....	.....	.....	.....	.....
1	14.50	.....	.....	.....	21.50	.....	.....	.....	.....	.....
†1 1/4	15.50	15.50	.....	.....	23.00	.....	31.50	.....	.....	.....
1 1/2	17.00	17.00	.....	.....	25.00	.....	34.50	.....	.....	.....
2	19.00	19.00	.....	.....	28.00	31.50	39.00	44.00	39.00	.....
2 1/2	22.00	22.00	.....	.....	32.50	36.50	45.00	51.00	45.00	.....
3	25.00	25.00	.....	.....	37.00	41.75	51.00	58.00	51.00	.....
3 1/2	29.00	29.00	.....	.....	43.00	48.50	60.00	68.00	60.00	.....
4	34.00	34.00	50.00	4.80	51.00	58.00	71.00	80.50	71.00	80.50
†4 1/2	42.25	42.25	61.25	4.80	62.50	71.50	86.50	98.50	86.50	98.50
5	47.75	47.75	72.75	4.80	72.25	82.25	100.50	114.50	100.50	114.50
6	61.00	61.00	93.00	4.80	91.00	104.00	126.00	143.00	126.00	143.00
†7	74.00	74.00	110.00	9.50	111.00	126.00	154.00	175.00	154.00	175.00
8	89.00	89.00	132.00	9.50	135.50	154.50	188.00	214.00	188.00	214.00
10	140.00	140.00	197.00	13.00	209.00	238.00	292.00	333.00	292.00	333.00
12	182.00	182.00	254.00	16.00	276.00	315.00	385.00	439.00	385.00	439.00
14	231.00	231.00	316.00	19.00	346.00	395.00	482.00	550.00	482.00	550.00
16	325.00	325.00	445.00	24.00	485.00	554.00	675.00	771.00	675.00	771.00

TAPER REDUCERS—Fig. No. 962

Size Inches	Faced, Drilled and Spot Faced Each	Size Inches	Faced, Drilled and Spot Faced Each	Size Inches	Faced, Drilled and Spot Faced Each
3 x2	25.00	†7x3	74.00	12x 5	182.00
3 1/2 x2 1/2	29.00	†7x4	74.00	12x 6	182.00
4 x2	34.00	†7x5	74.00	12x 8	182.00
4 x2 1/2	34.00	†7x6	74.00	12x10	182.00
4 x3	34.00	8x3	89.00	14x 6	231.00
5 x2	47.75	8x4	89.00	14x 8	231.00
5 x2 1/2	47.75	8x5	89.00	14x10	231.00
5 x3	47.75	8x6	89.00	14x12	231.00
5 x4	47.75	10x4	140.00	16x 8	325.00
6 x3	61.00	10x5	140.00	16x10	325.00
6 x3 1/2	61.00	10x6	140.00	16x12	325.00
6 x4	61.00	10x8	140.00	16x14	325.00
6 x5	61.00	.....	.....	.....	.....

The flanges of these fittings are regularly furnished with 1/4-inch raised face.

†Standard practice of manufacturers urges the discontinuance of these sizes which are considered as special.

See Notes on pages 280 and 294. See page 281 for pressure ratings at other temperatures.

Order by Figure Number.

CAST STEEL FLANGED FITTINGS

Series 90 (900 Pounds W. S. P.)

For 900 Lbs. W. S. P. at a Total Temperature of 750 Degrees

LIST PRICES

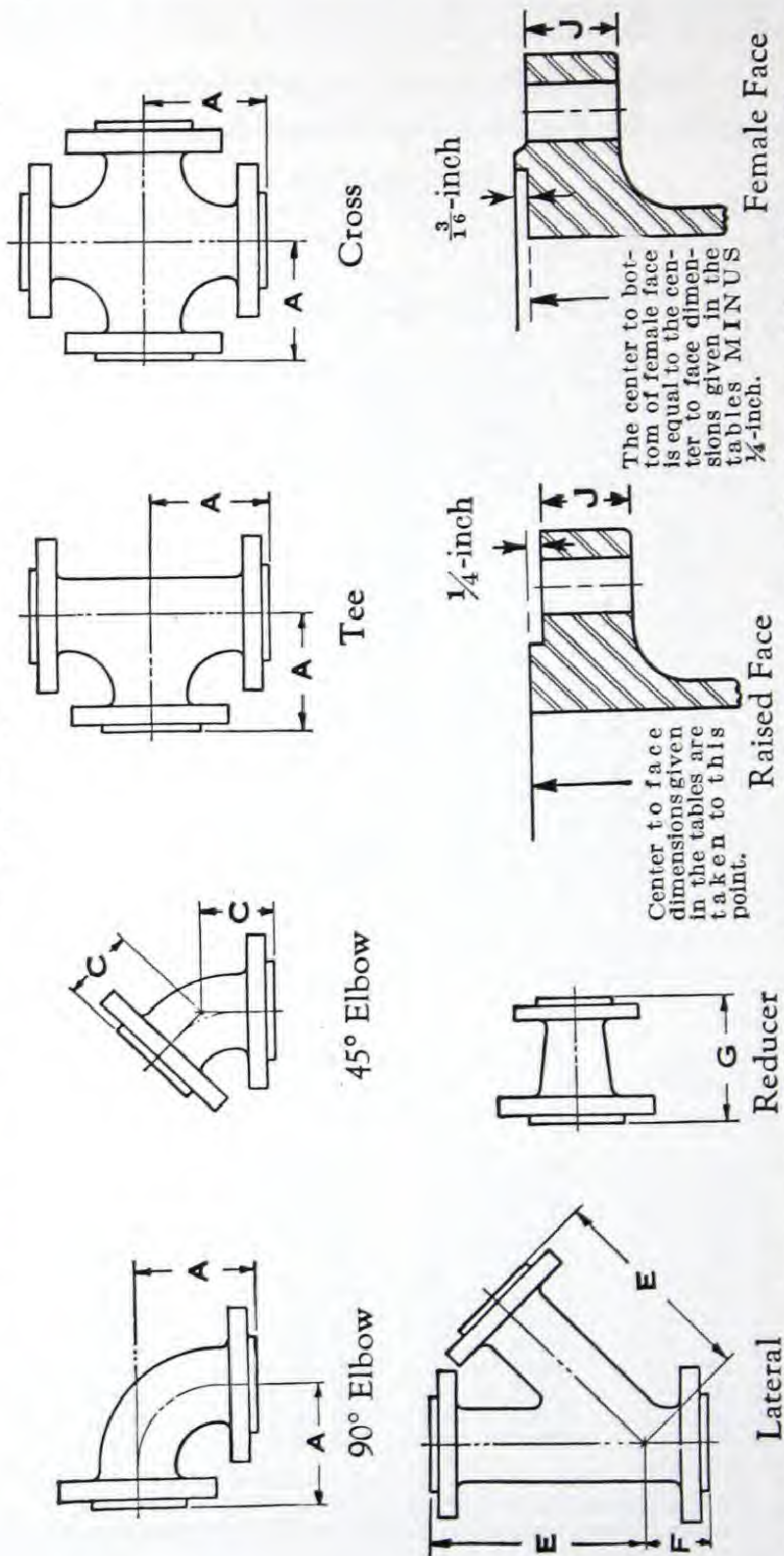
Size Inches	90° ELBS. No. 971	45° ELBS. No. 972	BASE ELBOWS Fig. No. 975		TEES		CROSSES		LATERALS	
	Faced, Drilled and Spot Faced Each	Faced, Drilled and Spot Faced Each	Faced, Drilled and Spot Faced, Except Base Flange Each	Facing, Drilling and Spot Facing Base Flange Each	Str. No. 976 Faced, Drilled and Spot Faced Each	Red. No. 977 Faced, Drilled and Spot Faced Each	Str. No. 978 Faced, Drilled and Spot Faced Each	Red. No. 979 Faced, Drilled and Spot Faced Each	Str. No. 980 Faced, Drilled and Spot Faced Each	Red. No. 981 Faced, Drilled and Spot Faced Each
1	16.50	.....	.....	.....	25.25	.....	.....	.....	.....	.....
1 1/4	18.00	18.00	.....	.....	27.75	.....	38.50	.....	38.50	.....
1 1/2	20.25	20.25	.....	.....	31.00	.....	43.00	.....	43.00	.....
2	24.00	24.00	.....	.....	37.00	42.00	51.00	58.00	51.00	.....
2 1/2	29.25	29.25	.....	.....	46.00	52.00	63.50	72.00	63.50	.....
3	35.75	35.75	.....	.....	56.50	64.00	78.50	89.00	78.50	.....
3 1/2	44.25	44.25	.....	.....	70.50	80.00	97.50	111.00	97.50	.....
4	54.00	54.00	81.00	6.00	84.50	96.00	117.00	133.00	117.00	133.00
4 1/2	65.75	65.75	98.75	6.00	103.00	117.00	141.50	161.00	141.50	161.00
5	77.50	77.50	116.50	6.00	122.00	139.00	168.00	191.00	168.00	191.00
6	100.00	100.00	150.00	6.00	155.00	176.00	215.00	244.00	215.00	244.00
7	128.00	128.00	191.00	12.00	200.00	227.00	276.00	314.00	276.00	314.00
8	177.00	177.00	262.00	12.00	276.00	314.00	381.00	434.00	381.00	434.00
10	263.00	263.00	373.00	16.00	415.00	472.00	574.00	654.00	574.00	654.00
12	360.00	360.00	505.00	20.00	565.00	643.00	785.00	894.00	785.00	894.00
14	450.00	450.00	620.00	24.00	705.00	802.00	975.00	1110.00	975.00	1110.00
16	585.00	585.00	800.00	30.00	918.00	1043.00	1270.00	1445.00	1270.00	1445.00

TAPER REDUCERS—Fig. No. 982

Size Inches	Faced, Drilled and Spot Faced Each	Size Inches	Faced, Drilled and Spot Faced Each	Size Inches	Faced, Drilled and Spot Faced Each
3 x 2	35.75	7x3	128.00	12x 5	360.00
3 1/2 x 2 1/2	44.25	7x4	128.00	12x 6	360.00
4 x 2	54.00	7x5	128.00	12x 8	360.00
4 x 2 1/2	54.00	7x6	128.00	12x10	360.00
4 x 3	54.00	8x3	177.00	14x 6	450.00
5 x 2	77.50	8x4	177.00	14x 8	450.00
5 x 2 1/2	77.50	8x5	177.00	14x10	450.00
5 x 3	77.50	8x6	177.00	14x12	450.00
5 x 4	77.50	10x4	263.00	16x 8	585.00
6 x 3	100.00	10x5	263.00	16x10	585.00
6 x 3 1/2	100.00	10x6	263.00	16x12	585.00
6 x 4	100.00	10x8	263.00	16x14	585.00
6 x 5	100.00	.....	.....	.....	.....

The flanges of these fittings are regularly furnished with 1/4-inch raised face.
 Standard practice of manufacturers urges the discontinuance of these sizes which are considered special.
 See Notes on pages 280 and 294. See page 281 for pressure ratings at other temperatures.
 Order by Figure Number.

DIMENSIONS Cast Steel Flanged Fittings—Series 40 (400 Pounds W. S. P.) Straight Sizes



Raised face is the standard facing for these fittings. Any other types of facing: i.e., Male, Female, Tongue or Groove, are special. See page 316.

Reducing Fittings have the same Center to Face dimensions as straight size fittings of the largest opening.

†Standard practice of manufacturers urges the discontinuance of 1 1/4, 4 1/2 and 7-inch sizes, which are considered as special and made only on order.

DIMENSIONS

Cast Steel Flanged Fittings—Series 40 (400 Pounds W. S. P.)

Straight Sizes

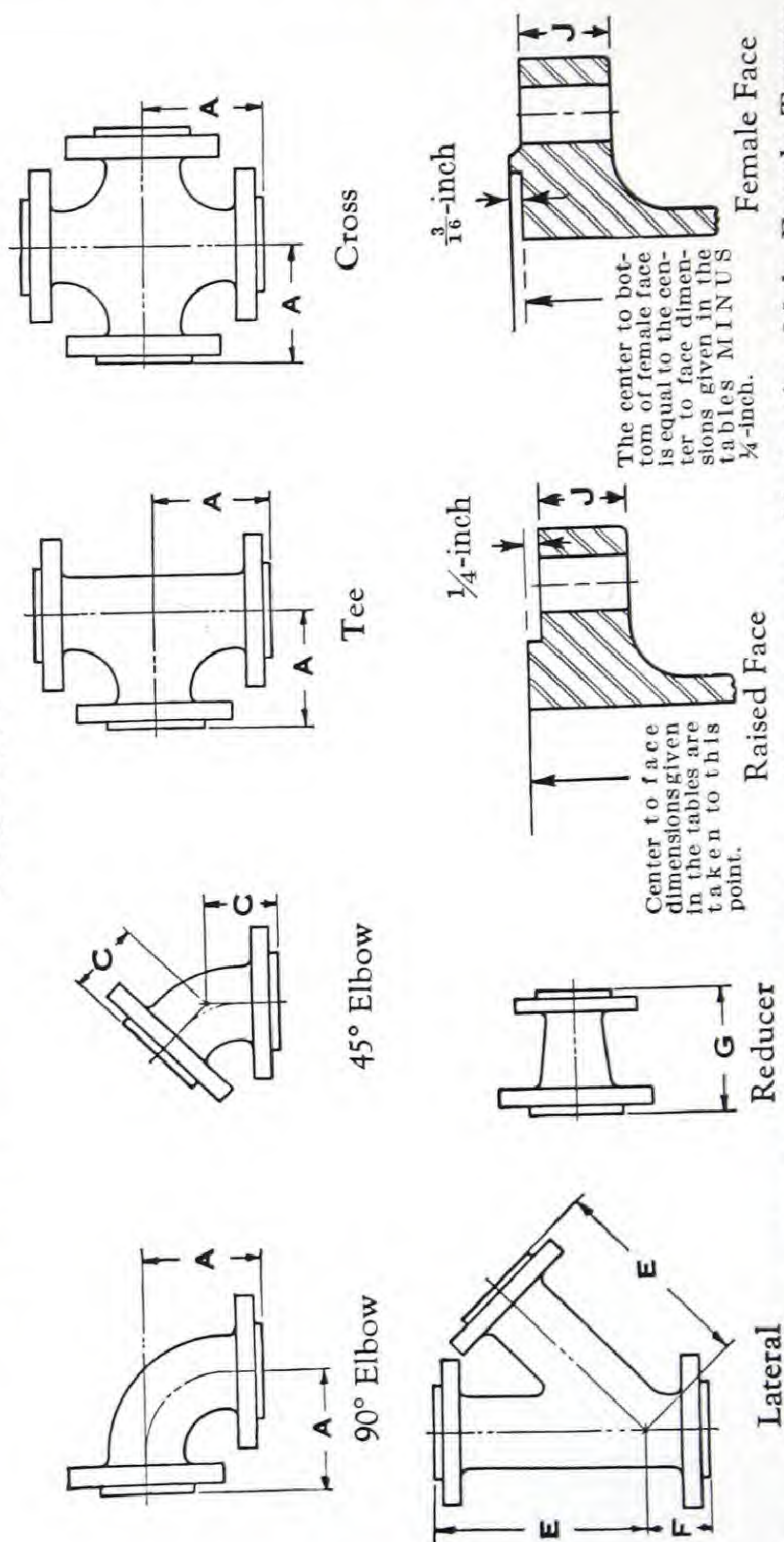
Dimensions for sizes 3½-inch and smaller are the same as for Series 60.

See Dimension Table for Series 60 on following pages.

When fittings are ordered as Series 40 in sizes 3½-inch and smaller, they will be made from the Series 60 patterns and marked as Series 60.

Size.....	4	4½	5	6	7	8	10	12	14-O.D.	16-O.D.	18-O.D.	20-O.D.	24-O.D.
Inside Diameter of Port..... Inches	4	4½	5	6	7	8	10	12	13½	15	17	18⅞	22⅝
A-Center to Face, Ell, Tee, Cross..	8	8½	9	9¾	10¾	11¾	13¼	15	16¼	17¾	19¼	20¾	24¼
C-Center to Face, 45° Ell... Inches	5½	5¾	6	6¼	6¾	6¾	7¾	8¾	9¼	10¼	10¾	11¼	12¾
E-Center to Face, Lateral... Inches	15¼	16¼	16¾	17¾	20¾	22¼	25¾	29¾	32¾	36¼	39¼	42¾	50¼
F-Center to Face, Lateral... Inches	4½	4¾	5	5¼	5½	5¾	6¼	6½	7	8	8½	9	10½
G-Face to Face, Reducer... Inches	8¼	8¾	9¼	10	11	12	13½	15¼	16½	18½	19½	21	24½
Diameter of Flange..... Inches	10	10½	11	12½	14	15	17½	20½	23	25½	28	30½	36
J-Thickness of Flange..... Inches	1⅜	1⅞	1½	1⅝	1¾	1⅞	2⅞	2¼	2⅝	2½	2⅝	2¾	3
Diameter of Raised Face... Inches	6⅝	6¾	7⅝	8½	9⅝	10⅝	12¾	15	16¼	18½	21	23	27¼
Number of Bolts..... Inches	8	8	8	12	12	12	16	16	20	20	24	24	24
Size of Bolt Holes..... Inches	1	1	1	1	1⅞	1⅞	1¼	1⅜	1⅜	1½	1½	1⅝	1⅞
Diameter of Bolt Circle... Inches	7⅞	8½	9¼	10⅝	11⅞	13	15¼	17¾	20¼	22½	24¾	27	32

DIMENSIONS Cast Steel Flanged Fittings—Series 60 (600 Pounds W. S. P.) Straight Sizes



Raised face is the standard facing for these fittings. Any other types of facing: i.e., Male, Female, Tongue or Groove, are special. See page 316.

Reducing Fittings have the same Center to Face dimensions as straight size fittings of the largest opening.

†Standard practice of manufacturers urges the discontinuance of 1 1/4, 4 1/2 and 7-inch sizes, which are considered as special and made only on order.

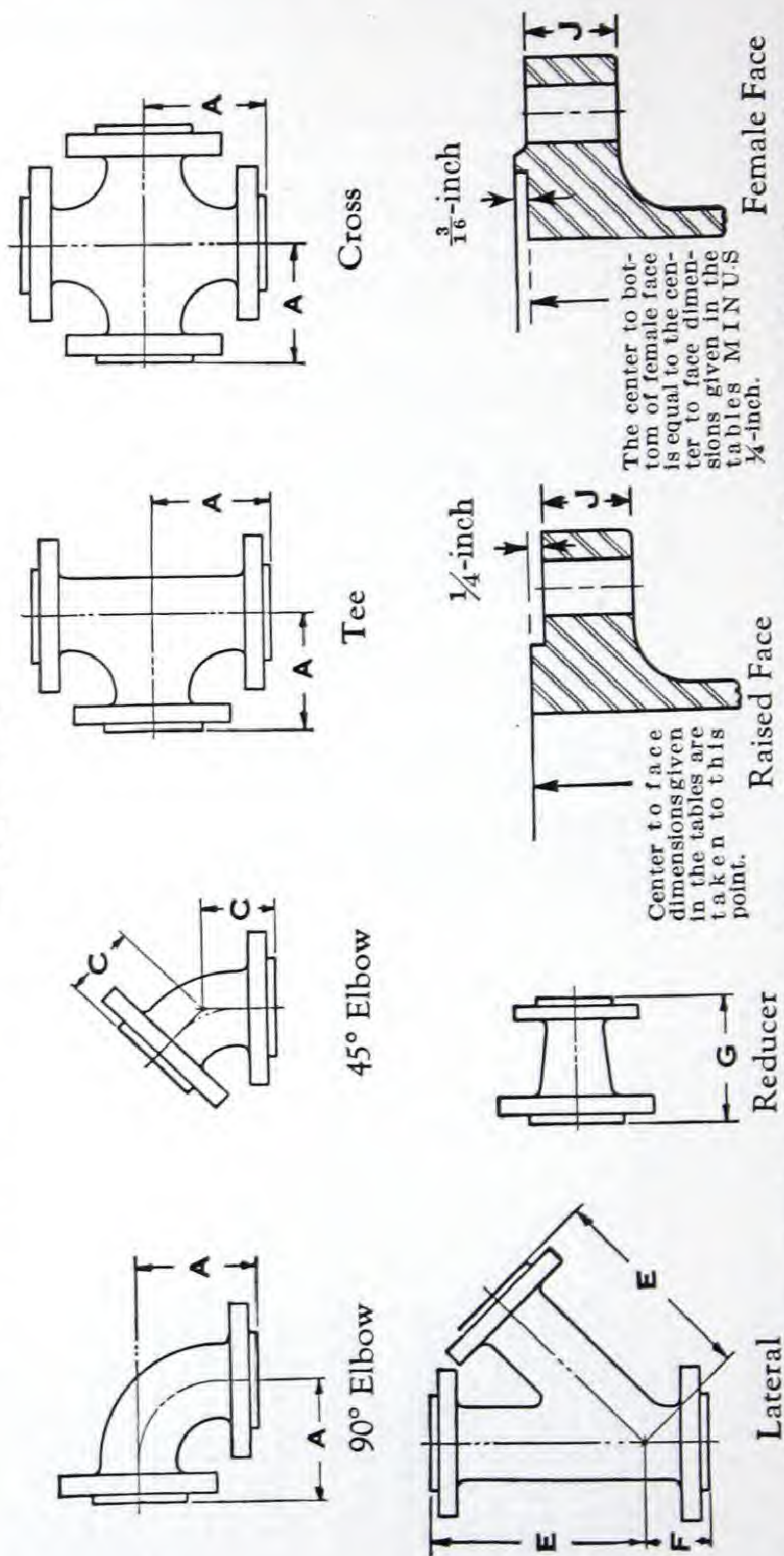
DIMENSIONS

Cast Steel Flanged Fittings—Series 60 (600 Pounds W. S. P.)

Straight Sizes

Size.....	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4
Inside Diameter of Port.....	Inches								
A-Center to Face, Ell, Tee, Cross.....	Inches	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4
C-Center to Face, 45° Ell.....	Inches	$4\frac{1}{4}$	$4\frac{1}{2}$	$4\frac{3}{4}$	$5\frac{3}{4}$	$6\frac{1}{2}$	7	$7\frac{1}{2}$	$8\frac{1}{2}$
E-Center to Face, Lateral.....	Inches	$2\frac{1}{2}$	$2\frac{3}{4}$	3	$4\frac{1}{4}$	$4\frac{1}{2}$	5	$5\frac{1}{2}$	6
F-Center to Face, Lateral.....	Inches	$6\frac{3}{4}$	$7\frac{1}{2}$	$8\frac{3}{4}$	11	$12\frac{1}{2}$	$13\frac{1}{2}$	$14\frac{1}{2}$	$16\frac{1}{2}$
G-Face to Face, Reducer.....	Inches	$2\frac{1}{4}$	$2\frac{1}{2}$	$2\frac{3}{4}$	$3\frac{1}{2}$	$3\frac{1}{2}$	4	$4\frac{1}{2}$	$4\frac{1}{2}$
Diameter of Flange.....	Inches	5	5	5	6	$6\frac{3}{4}$	$7\frac{1}{4}$	$7\frac{3}{4}$	$8\frac{3}{4}$
J-Thickness of Flange.....	Inches	$4\frac{7}{8}$	$5\frac{1}{4}$	$6\frac{1}{8}$	6	$7\frac{1}{2}$	$8\frac{1}{4}$	9	$10\frac{3}{4}$
Diameter of Raised Face.....	Inches	$\frac{11}{16}$	$\frac{9}{16}$	$\frac{7}{8}$	1	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{3}{8}$	$1\frac{1}{2}$
Number of Bolts.....	Inches	2	$2\frac{1}{2}$	$2\frac{7}{8}$	$3\frac{5}{8}$	4	5	$5\frac{1}{2}$	$6\frac{3}{8}$
Size of Bolt Holes.....	Inches	4	4	4	5	5	5	5	5
Diameter of Bolt Circle.....	Inches	$3\frac{3}{4}$	$3\frac{7}{8}$	$4\frac{1}{2}$	$5\frac{3}{4}$	$5\frac{7}{8}$	$6\frac{5}{8}$	$7\frac{1}{4}$	$8\frac{1}{2}$
Size.....	Inches	$4\frac{1}{2}$	5	6	7	8	10	12	14-O.D. 16-O.D.
Inside Diameter of Port.....	Inches								
A-Center to Face, Ell, Tee, Cross.....	Inches	5	6	6	7	$7\frac{7}{8}$	11	$11\frac{3}{4}$	$14\frac{3}{4}$
C-Center to Face, 45° Ell.....	Inches	10	11	12	13	13	16	$16\frac{1}{2}$	$19\frac{1}{2}$
E-Center to Face, Lateral.....	Inches	7	$7\frac{1}{2}$	8	$8\frac{1}{2}$	$8\frac{1}{2}$	10	$10\frac{3}{4}$	$11\frac{3}{4}$
F-Center to Face, Lateral.....	Inches	$19\frac{1}{2}$	21	$22\frac{1}{2}$	$24\frac{1}{2}$	$29\frac{1}{2}$	$31\frac{1}{2}$	$34\frac{1}{4}$	$38\frac{1}{2}$
G-Face to Face, Reducer.....	Inches	6	$6\frac{1}{2}$	$6\frac{1}{2}$	7	8	$8\frac{1}{2}$	9	10
Diameter of Flange.....	Inches	$10\frac{1}{4}$	$11\frac{1}{4}$	$12\frac{1}{4}$	$13\frac{1}{4}$	$15\frac{3}{4}$	$16\frac{3}{4}$	$17\frac{3}{4}$	$19\frac{3}{4}$
J-Thickness of Flange.....	Inches	13	14	15	$16\frac{1}{2}$	20	22	$23\frac{3}{4}$	27
Diameter of Raised Face.....	Inches	$1\frac{3}{4}$	$1\frac{7}{8}$	$2\frac{1}{8}$	$2\frac{3}{8}$	$2\frac{1}{2}$	$2\frac{5}{8}$	$2\frac{3}{4}$	3
Number of Bolts.....	Inches	$7\frac{5}{16}$	$8\frac{1}{2}$	$9\frac{5}{8}$	$10\frac{5}{8}$	$12\frac{3}{4}$	15	$16\frac{1}{4}$	$18\frac{1}{2}$
Size of Bolt Holes.....	Inches	8	12	12	12	16	20	20	20
Diameter of Bolt Circle.....	Inches	$11\frac{1}{2}$	$11\frac{1}{2}$	$11\frac{1}{2}$	$13\frac{3}{4}$	$17\frac{1}{2}$	$19\frac{1}{4}$	$20\frac{3}{4}$	$23\frac{3}{4}$

DIMENSIONS Cast Steel Flanged Fittings—Series 90 (900 Pounds W. S. P.) Straight Sizes



Raised face is the standard facing for these fittings. Any other types of facing: i.e., Male, Female, Tongue or Groove, are special. See page 316.

Reducing Fittings have the same Center to Face dimensions as straight size fittings of the largest opening. †Standard practice of manufacturers urges the discontinuance of 1 1/4, 4 1/2 and 7-inch sizes, which are considered as special and made only on order.

DIMENSIONS

Cast Steel Flanged Fittings—Series 90 (900 Pounds W. S. P.)

Straight Sizes

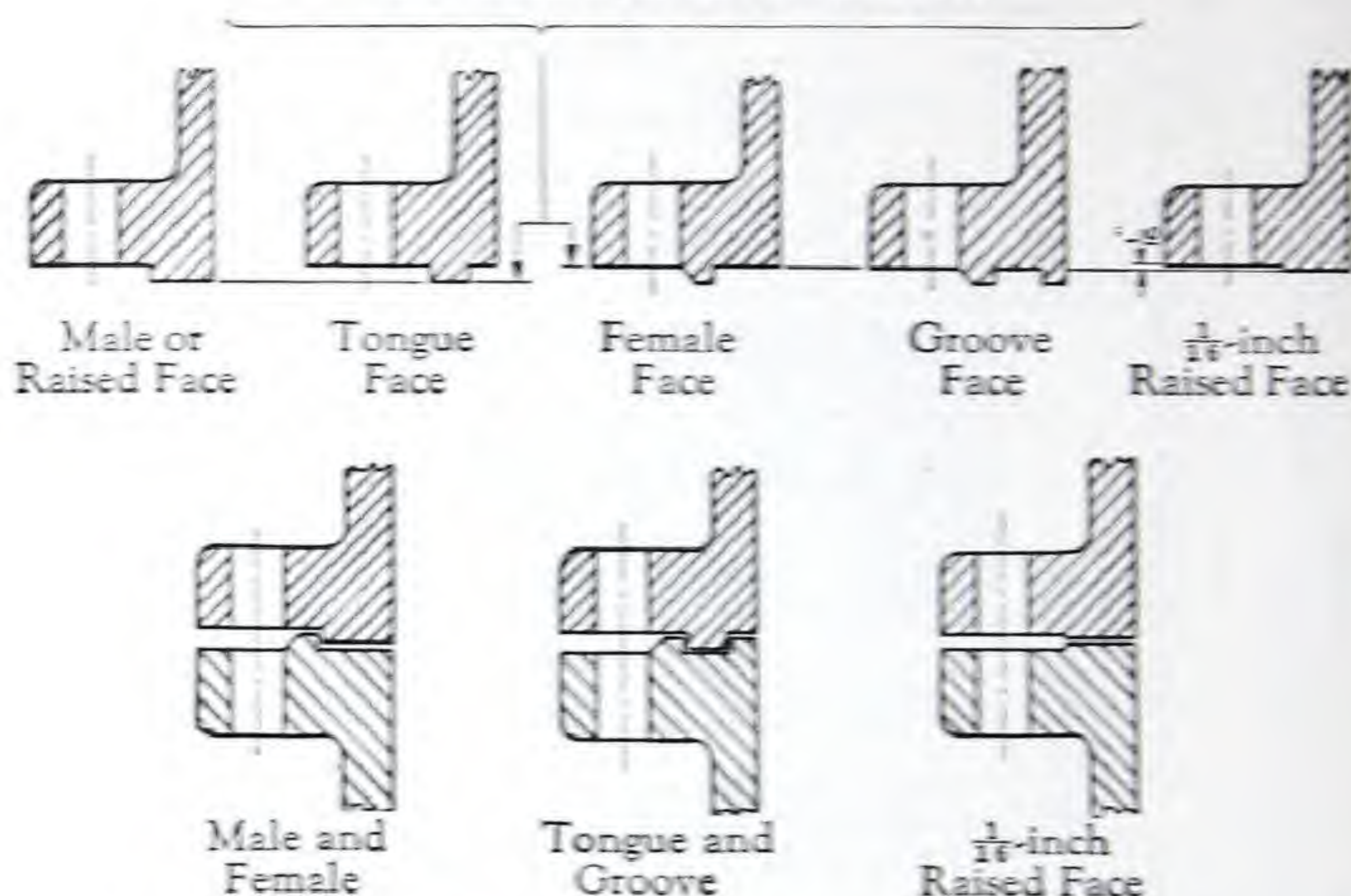
Size.....	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4	4 1/2
Inside Diameter of Port.....	Inches	1 1/4	1 1/2	1 5/8	2 1/8	2 1/2	3 1/8	3 3/8	4 1/4
A-Center to Face, Ell, Tee, Cross.....	Inches	5 1/2	6	6 1/2	7	7 1/2	8 1/2	9	10
C-Center to Face, 45° Ell.....	Inches	4	4 1/4	4 1/2	5	5 1/2	6	6 1/2	6 1/2
E-Center to Face, Lateral.....	Inches	10	11	12 1/2	13 1/2	14 1/2	16 1/2	17 1/2	19 1/2
F-Center to Face, Lateral.....	Inches	3	3 1/2	3 3/4	4	4 1/2	4 1/2	5 1/2	6
G-Face to Face, Reducer.....	Inches	5 3/4	6 1/4	7 1/4	8 1/2	9 1/2	10 3/4	11 1/2	13
Diameter of Flange.....	Inches	6 1/4	7	7 1/2	8 1/2	9 1/2	10 3/4	11 1/2	13
J-Thickness of Flange.....	Inches	1 1/8	1 1/8	1 1/4	1 3/8	1 1/2	1 5/8	1 3/4	1 7/8
Diameter of Raised Face.....	Inches	2 1/2	2 7/8	3 5/8	4 1/8	5	5 1/2	6 3/8	6 3/4
Number of Bolts.....	Inches	4	4	8	8	8	8	8	8
Size of Bolt Holes.....	Inches	7/8	1	1 1/8	1 1/8	1 1/8	1 1/8	1 1/4	1 1/4
Diameter of Bolt Circle.....	Inches	4 3/8	4 7/8	5 7/8	6 1/2	7 1/2	8 1/2	9 1/4	10 1/2

Size.....	5	6	7	8	10	12	14-O.D.	16-O.D.
Inside Diameter of Port.....	Inches	5 3/4	6 5/8	7 9/16	9 7/16	11 1/4	12 3/8	14 3/16
A-Center to Face, Ell, Tee, Cross.....	Inches	12	13	14 1/2	16 1/2	19	20 1/4	22 1/4
C-Center to Face, 45° Ell.....	Inches	8	8 1/2	9	10	11	11 1/2	12 1/2
E-Center to Face, Lateral.....	Inches	22 1/2	24 1/2	27 1/2	31 1/2	34 1/2	36 1/2	40 3/4
F-Center to Face, Lateral.....	Inches	6 1/2	7	7 1/2	8 1/2	9	9 1/2	10 1/2
G-Face to Face, Reducer.....	Inches	11 1/4	13 1/4	14 3/4	16 3/4	17 3/4	19	21
Diameter of Flange.....	Inches	13 3/4	16 1/2	18 1/2	21 1/2	24	25 1/4	27 3/4
J-Thickness of Flange.....	Inches	2	2 3/8	2 1/2	2 3/4	3 1/8	3 3/8	3 1/2
Diameter of Raised Face.....	Inches	7 5/16	8 1/2	10 5/8	12 3/4	15	16 1/4	18 1/2
Number of Bolts.....	Inches	8	12	12	16	20	20	20
Size of Bolt Holes.....	Inches	1 3/8	1 3/8	1 1/2	1 1/2	1 1/2	1 5/8	1 3/4
Diameter of Bolt Circle.....	Inches	11	12 1/2	13 3/4	18 1/2	21	22	24 1/4

FACINGS

Cast Steel Flanged Fittings and Valves

*All Center to Face—and Face to Face Dimensions
are measured at the Contact Face.*



All Cast Steel Flanged Fittings and Valves are regularly furnished with Raised Face.

Series 15, 25 and 30 have $\frac{1}{16}$ -inch raised face.

If, in special cases, a $\frac{3}{4}$ -inch raised or tongue face is wanted on Series 15, 25 or 30, the center to contact face will be $\frac{1}{4}$ -inch greater than given in the tables. For female or groove faces, the center to contact face will be the same as given in the tables.

Series 40, 60 and 90 have $\frac{1}{4}$ -inch raised face.

If, in special cases, a $\frac{1}{16}$ -inch raised face is wanted on Series 40, 60 or 90, the center to contact face will be $\frac{1}{16}$ -inch less than given in tables. In effect, the $\frac{1}{4}$ -inch raised face will be reduced to $\frac{1}{16}$ -inch.

All center to face and face to face dimensions are measured at the contact face. The dimensions in preceding tables are given to the raised face. In the Series 40, 60 and 90 fittings the center to bottom of female face is equal to the center to face dimension given in dimension tables MINUS $\frac{1}{4}$ -inch.

Male, Female, Tongue or Groove Faces are considered special.

Standard practice of manufacturers urges the discontinuance of sizes $1\frac{1}{4}$, $4\frac{1}{2}$ and 7-inch which are considered as special.

DIMENSIONS

Gaskets

For Cast Steel Flanged Fittings and Valves

The following table gives inside and outside diameters of Ring Gaskets for Series 25, 30, 40, 60 and 90 (150, 250, 300, 400, 600 and 900 Pound W. S. P.). These Gaskets fit just inside of the bolts.

Diameters are also given for Gaskets for Male and Female Joints.

Pipe Size Inches	RING GASKETS					GASKETS FOR MALE AND FEMALE JOINTS		
	Series	Series	Series	Series	Series	Series	Series	Series
	15	25 and 30	40	60	90	40	60	90
1/4	.....	.....	3/4 x 2 5/8	3/4 x 2 5/8	.....	3/4 x 1 1/16	3/4 x 1 1/16	.....
1/2	.....	1 x 2 3/4	1 x 2 7/8	1 x 2 7/8	5/8 x 3 1/4	1 x 2	1 x 2	5/8 x 2
3/4	.....	1 1/4 x 3 1/4	1 1/4 x 3 1/4	1 1/4 x 3 1/4	1 1/8 x 3 5/8	1 1/4 x 2 1/2	1 1/4 x 2 1/2	1 1/8 x 2 1/2
1	.....	1 1/2 x 3 7/8	1 1/2 x 3 3/4	1 1/2 x 3 3/4	1 1/8 x 4	1 1/2 x 2 7/8	1 1/2 x 2 7/8	1 1/8 x 2 7/8
1 1/2	2 x 4 1/8	2 x 4 3/8	2 x 4 3/8	2 x 4 3/8	1 5/8 x 5 1/8	2 x 3 5/8	2 x 3 5/8	1 5/8 x 3 5/8
2	2 1/2 x 4 7/8	2 1/2 x 5 1/8	2 1/2 x 5 1/8	2 1/2 x 5 1/8	2 3/8 x 5 5/8	2 1/2 x 4 1/8	2 1/2 x 4 1/8	2 3/8 x 4 1/8
2 1/2	3 x 5 3/8	3 x 5 7/8	3 x 5 7/8	3 x 5 7/8	2 5/8 x 6 5/8	3 x 5	3 x 5	2 5/8 x 5
3	3 1/2 x 6 3/8	3 1/2 x 6 1/2	3 1/2 x 6 3/8	3 1/2 x 6 3/8	3 3/8 x 7 1/2	3 1/2 x 5 1/2	3 1/2 x 5 1/2	3 3/8 x 5 1/2
3 1/2	4 x 6 7/8	4 x 7 1/8	4 x 7	4 x 7 5/8	3 13/16 x 8 1/8	4 x 6 3/16	4 x 6 3/16	3 13/16 x 6 3/16
4	4 1/2 x 7	4 1/2 x 7 3/4	4 1/2 x 7 5/8	4 1/2 x 8 1/4	4 1/4 x 9 3/8	4 1/2 x 6 3/4	4 1/2 x 6 3/4	4 1/4 x 6 3/4
4 1/2	5 x 7 3/4	5 x 8 1/2	5 x 8 3/8	5 x 9 1/2	4 3/4 x 9 3/4	5 x 7 5/16	5 x 7 5/16	4 3/4 x 7 5/16
5	6 x 8 3/4	6 x 9 7/8	6 x 9 3/4	6 x 10 1/2	5 3/4 x 11 3/8	6 x 8 1/2	6 x 8 1/2	5 3/4 x 8 1/2
5 1/2	7 x 10	7 x 11	7 x 10 7/8	6 7/8 x 11 3/8	6 5/8 x 12 1/2	7 x 9 5/8	6 7/8 x 9 5/8	6 5/8 x 9 5/8
6	8 x 11	8 x 12 1/8	8 x 12	7 7/8 x 12 5/8	7 9/16 x 14 1/8	8 x 10 5/8	7 7/8 x 10 5/8	7 9/16 x 10 5/8
6 1/2	10 x 13 3/8	10 x 14 1/4	10 x 14 1/8	9 3/4 x 15 3/4	9 7/16 x 17 1/8	10 x 12 3/4	9 3/4 x 12 3/4	9 7/16 x 12 3/4
7	12 x 16 1/8	12 x 16 5/8	12 x 16 1/2	11 3/4 x 18	11 1/4 x 19 5/8	12 x 15	11 3/4 x 15	11 1/4 x 15
7 1/2	14 x 17 3/4	13 1/4 x 19 1/8	13 1/8 x 19	12 7/8 x 19 3/8	12 3/8 x 20 1/2	13 1/8 x 16 1/4	12 7/8 x 16 1/4	12 3/8 x 16 1/4
8	16 x 20 1/4	15 1/4 x 21 1/4	15 x 21 1/8	14 3/4 x 22 1/4	14 3/16 x 22 5/8	15 x 18 1/2	14 3/4 x 18 1/2	14 3/16 x 18 1/2
8 1/2	18 x 21 5/8	17 x 23 1/2	17 x 23 3/8	.....	.....	17 x 21	.....	.....
9	20 x 24 7/8	19 x 25 5/8	18 7/8 x 25 1/2	.....	.....	18 7/8 x 23	.....	.....
9 1/2	24 x 28 1/4	23 x 30 3/8	22 5/8 x 30 1/4	.....	.....	22 5/8 x 27 1/4	.....	.....

FLANGES

*Cast Iron Flanges**Floor Flanges—Greenhouse Flanges*

Floor Flange
Fig. No. 1006



Greenhouse Flange
Fig. No. 1007

FLOOR FLANGE—Fig. No. 1006

Size.....Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1
Price, Black.....Each	.14	.14	.15	.18	.22
Price, Galv.....Each	.28	.28	.30	.36	.44
Diameter of Flange.....Inches	$2\frac{5}{8}$	$2\frac{7}{8}$	$3\frac{1}{16}$	$3\frac{7}{16}$	$3\frac{7}{8}$
Number of Wood Screws.....	3	3	3	3	3
Size of Screws.....	No. 12	No. 12	No. 14	No. 14	No. 18

Size.....Inches	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Price, Black.....Each	.30	.36	.45	.85	1.00
Price, Galv.....Each	.60	.72	.90	1.70	2.00
Diameter of Flange.....Inches	$4\frac{1}{4}$	$4\frac{1}{2}$	$5\frac{1}{8}$	6	$6\frac{5}{8}$
Number of Wood Screws.....	3	3	3	4	4
Size of Screws.....	No. 18	No. 18	No. 18	No. 18	No. 18

GREENHOUSE FLANGE—Fig. No. 1007

Size.....Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$
Price, Black.....Each	.14	.14	.15	.18
Price, Galv.....Each	.28	.28	.30	.36
Diameter of Flange.....Inches	$2\frac{3}{4}$	$2\frac{7}{8}$	$3\frac{1}{2}$	4
Width of Flange.....Inches	$1\frac{1}{4}$	$1\frac{3}{8}$	$1\frac{5}{8}$	$1\frac{7}{8}$
Number of Wood Screws.....	2	2	2	2
Size of Screws.....	No. 10	No. 10	No. 14	No. 14

Size.....Inches	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Price, Black.....Each	.22	.30	.36	.45
Price, Galv.....Each	.44	.60	.72	.90
Diameter of Flange.....Inches	4	$4\frac{1}{2}$	$4\frac{3}{4}$	$5\frac{3}{8}$
Width of Flange.....Inches	$1\frac{7}{8}$	$2\frac{1}{4}$	$2\frac{1}{2}$	3
Number of Wood Screws.....	2	2	2	2
Size of Screws.....	No. 18	No. 18	No. 18	No. 18

Order by Figure Number.

FLANGES

Standard Cast Iron Flanges

Locknut Flanges—Slip or Ring Flanges

125 Lbs. Steam Pressure

Locknut Flange
Fig. No. 1008

175 Lbs. Water Pressure

Slip or Ring Flange
Fig. No. 1009

LOCKNUT FLANGES—Fig. No. 1008

Size.	Inches	2	2½	3	3½
Diameter of Flange	Inches	6	7	7½	8½
Price, Black.	Each	.75	.85	.95	1.20
Price, Galvanized	Each	1.45	1.60	1.80	2.20

Size.	Inches	4	5	6	8
Diameter of Flange	Inches	9	10	11	13½
Price, Black.	Each	1.35	1.60	2.00	3.10
Price, Galvanized	Each	2.55	2.95	3.65	5.60

SLIP OR RING FLANGES—Fig. No. 1009

Size.	Inches	2	2½	3	3½
Diameter of Flange	Inches	6	7	7½	8½
Price, Black.	Each	.75	.85	.95	1.20
Price, Galvanized	Each	1.45	1.60	1.80	2.20

Size.	Inches	4	5	6	8
Diameter of Flange	Inches	9	10	11	13½
Price, Black.	Each	1.35	1.60	2.00	3.10
Price, Galvanized	Each	2.55	2.95	3.65	5.60

Locknut Flanges are furnished faced only.

Slip or Ring Flanges are furnished faced on face of flange and on back of hub.

Order by Figure Number.

FLANGES

Standard Companion Flanges

Cast Iron, High-Test Gray-Iron (Semi-Steel), Cast Steel,
Forged Steel and Malleable Iron

For 125 Lbs. Steam Pressure, except as noted



Flange
Showing Hub



*Flange
Showing Smooth Face

LIST PRICES

SIZE INCHES	CAST IRON Fig. No. 1011		HIGH-TEST GRAY-IRON, (SEMI-STEEL) Fig. No. 1012		MALLEABLE IRON Fig. No. 1013		CAST STEEL SERIES 15 Fig. No. 1014		FORGED STEEL Fig. No. 1015	
	Faced Each	Faced and Drilled Each	Faced Each	Faced and Drilled Each	Faced Each	Faced and Drilled Each	Faced Each	Faced and Drilled Each	Faced Each	Faced and Drilled Each
1 x 4	\$0.55	\$0.80	\$0.70	\$1.00	.....	.....	.....	.....	\$7.50	\$8.00
1 1/4 x 4 1/2	.60	.85	.75	1.05	.....	.....	5.40	7.00	8.40	9.00
1 1/2 x 5	.65	.90	.80	1.10	.....	.....	5.90	7.50	9.40	10.00
2 x 6	.75	1.00	.95	1.25	1.50	2.00	6.90	8.50	10.40	11.00
2 1/2 x 7	.85	1.10	1.05	1.35	1.70	2.20	7.30	9.50	11.80	13.00
3 x 7 1/2	.95	1.25	1.20	1.55	1.90	2.50	8.70	12.00	13.70	15.00
3 1/2 x 8 1/2	1.20	1.55	1.50	1.95	2.40	3.10	12.10	15.50	17.60	19.00
4 x 9	1.35	1.80	1.70	2.25	2.70	3.60	14.80	18.50	18.30	20.00
†4 1/2 x 9 1/4	1.45	1.90	1.80	2.35	2.90	3.80	15.80	19.50	20.30	22.00
5 x 10	1.60	2.05	2.00	2.55	3.20	4.10	16.80	20.50	22.30	24.00
6 x 11	2.00	2.50	2.50	3.10	4.00	5.00	20.40	25.00	25.40	27.00
†7 x 12 1/2	2.65	3.25	3.30	4.05	5.30	6.50	24.70	30.50	27.20	32.00
8 x 13 1/2	3.10	3.80	3.90	4.75	6.20	7.60	27.00	33.00	32.00	35.00
†9 x 15	3.85	4.65	4.80	5.80	7.70	9.30	29.50	35.50	37.00	40.00
10 x 16	4.50	5.50	5.65	6.85	9.00	11.00	34.50	41.50	45.00	48.00
12 x 19	6.50	7.65	8.15	9.55	13.00	15.30	46.00	54.00	56.00	60.00
14 x 21	9.00	10.35	11.25	13.00	18.00	20.70	55.50	63.00	75.50	80.00
†15 x 21	11.50	13.20	14.50	16.50	23.00	26.40	64.00	74.00	.....	.....
15 x 22 1/4	11.50	13.20	14.50	16.50	23.00	26.40	64.00	74.00	.....	.....
16 x 23 1/2	13.50	15.30	17.00	19.00	27.00	30.60	78.00	89.00	.....	.....
18 x 25	16.00	18.00	20.00	22.50	.....	.....	98.00	110.00	.....	.....
20 x 27 1/2	19.00	21.50	24.00	27.00	.....	.....	117.00	130.00	.....	.....
†22 x 29 1/2	22.00	25.00	27.50	31.00	.....	.....	140.00	155.00	.....	.....
24 x 32	27.00	30.50	34.00	38.00	.....	.....	165.00	180.00	.....	.....

Cast Steel Flanges when ordered faced and drilled will be furnished with bolt holes spot faced at prices given above.

*Cast Steel and Forged Steel Flanges are furnished with 1/16-inch raised face, unless otherwise ordered. Other Standard Flanges are furnished smooth face.

†Standard practice of manufacturers urges the discontinuance of these sizes.
For galvanized list prices, see page 239.
Order by Figure Number.

FLANGES

Standard Cast Iron Flanges

125 Lbs. Steam Pressure

175 Lbs. Water Pressure

Reducing Companion Flange
Fig. No. 1016Reducing
Companion
FlangesEccentric Reducing Flange
Fig. No. 1017

Prices on Application

LIST PRICES—CAST IRON—Fig. No. 1016

Size Inches	Faced Each	Faced and Drilled Each	Size Inches	Faced Each	Faced and Drilled Each	Size Inches	Faced Each	Faced and Drilled Each
1 x 6	1.30	1.55	3½ x 12½	4.40	5.00	5 x 19	10.75	11.90
1¼ x 5	1.30	1.55	4 x 12½	4.40	5.00	6 x 19	10.75	11.90
1¼ x 6	1.30	1.55	†4½ x 12½	4.40	5.00	†7 x 19	10.75	11.90
1¼ x 7	1.30	1.55	5 x 12½	4.40	5.00	8 x 19	10.75	11.90
1½ x 6	1.30	1.55	6 x 12½	4.40	5.00	†9 x 19	10.75	11.90
1½ x 7	1.45	1.70	1½ x 13½	5.10	5.80	10 x 19	10.75	11.90
2 x 7	1.45	1.70	2 x 13½	5.10	5.80	4 x 21	15.00	16.35
1½ x 7½	1.55	1.85	2½ x 13½	5.10	5.80	5 x 21	15.00	16.35
2 x 7½	1.55	1.85	3 x 13½	5.10	5.80	6 x 21	15.00	16.35
2½ x 7½	1.55	1.85	3½ x 13½	5.10	5.80	†7 x 21	15.00	16.35
1½ x 8½	2.00	2.35	4 x 13½	5.10	5.80	8 x 21	15.00	16.35
2 x 8½	2.00	2.35	5 x 13½	5.10	5.80	†9 x 21	15.00	16.35
2½ x 8½	2.00	2.35	6 x 13½	5.10	5.80	10 x 21	15.00	16.35
3 x 8½	2.00	2.35	†7 x 13½	5.10	5.80	12 x 21	15.00	16.35
1½ x 9	2.20	2.65	1½ x 15	6.35	7.15	8 x 22¼	19.00	20.70
2 x 9	2.20	2.65	2 x 15	6.35	7.15	10 x 22¼	19.00	20.70
2½ x 9	2.20	2.65	2½ x 15	6.35	7.15	12 x 22¼	19.00	20.70
3 x 9	2.20	2.65	3 x 15	6.35	7.15	14 x 22¼	19.00	20.70
3½ x 9	2.20	2.65	3½ x 15	6.35	7.15	6 x 23½	22.00	23.80
1½ x 9¼	2.40	2.85	4 x 15	6.35	7.15	8 x 23½	22.00	23.80
2 x 9¼	2.40	2.85	†4½ x 15	6.35	7.15	10 x 23½	22.00	23.80
2½ x 9¼	2.40	2.85	5 x 15	6.35	7.15	12 x 23½	22.00	23.80
3 x 9¼	2.40	2.85	6 x 15	6.35	7.15	14 x 23½	22.00	23.80
3½ x 9¼	2.40	2.85	†7 x 15	6.35	7.15	†15 x 23½	22.00	23.80
4 x 9¼	2.40	2.85	8 x 15	6.35	7.15	6 x 25	26.50	28.50
1½ x 10	2.65	3.10	1½ x 16	7.45	8.45	8 x 25	26.50	28.50
2 x 10	2.65	3.10	2 x 16	7.45	8.45	10 x 25	26.50	28.50
2½ x 10	2.65	3.10	2½ x 16	7.45	8.45	12 x 25	26.50	28.50
3 x 10	2.65	3.10	3 x 16	7.45	8.45	14 x 25	26.50	28.50
3½ x 10	2.65	3.10	3½ x 16	7.45	8.45	†15 x 25	26.50	28.50
4 x 10	2.65	3.10	4 x 16	7.45	8.45	16 x 25	26.50	28.50
†4½ x 10	2.65	3.10	†4½ x 16	7.45	8.45	14 x 27½	31.00	33.50
1½ x 11	3.30	3.80	5 x 16	7.45	8.45	†15 x 27½	31.00	33.50
2 x 11	3.30	3.80	6 x 16	7.45	8.45	16 x 27½	31.00	33.50
2½ x 11	3.30	3.80	†7 x 16	7.45	8.45	18 x 27½	31.00	33.50
3 x 11	3.30	3.80	8 x 16	7.45	8.45	†15 x 29½	36.00	39.00
3½ x 11	3.30	3.80	†9 x 16	7.45	8.45	16 x 29½	36.00	39.00
4 x 11	3.30	3.80	1½ x 19	10.75	11.90	18 x 29½	36.00	39.00
†4½ x 11	3.30	3.80	2 x 19	10.75	11.90	20 x 29½	36.00	39.00
5 x 11	3.30	3.80	2½ x 19	10.75	11.90	14 x 32	44.00	47.50
1½ x 12½	4.40	5.00	3 x 19	10.75	11.90	16 x 32	44.00	47.50
2 x 12½	4.40	5.00	3½ x 19	10.75	11.90	18 x 32	44.00	47.50
2½ x 12½	4.40	5.00	4 x 19	10.75	11.90	20 x 32	44.00	47.50
3 x 12½	4.40	5.00	†4½ x 19	10.75	11.90	.....	.....	.....

For galvanized list prices, see page 239.

Eccentric reducing companion flanges furnished to order. Prices on application.
†Standard practice of manufacturers urges the discontinuance of these sizes.

Order by Figure Number.

FLANGES

Standard Blind Flanges

Cast Iron, High-Test Gray-Iron (Semi-Steel), Cast Steel

125 Lbs. Steam Pressure

175 Lbs. Water Pressure



Blind Flange

LIST PRICES

Size of Valve or Fitting and O. D. of Flange Inches	CAST IRON Fig. No. 1018		HIGH-TEST GRAY-IRON (SEMI-STEEL) Fig. No. 1019		CAST STEEL SERIES 15 Fig. No. 1020	
	Faced Each	Faced and Drilled Each	Faced Each	Faced and Drilled Each	Faced Each	Faced and Drilled Each
2 x 6	1.15	1.40	1.45	1.75	8.40	10.00
2½ x 7	1.30	1.55	1.65	1.95	8.80	11.00
3 x 7½	1.40	1.70	1.75	2.15	10.70	13.00
3½ x 8½	1.80	2.15	2.25	2.70	14.60	17.00
4 x 9	2.00	2.45	2.50	3.10	18.30	22.00
†4½ x 9¼	2.20	2.65	2.75	3.35	19.80	23.50
5 x 10	2.40	2.85	3.00	3.60	20.80	24.50
6 x 11	3.00	3.50	3.75	4.40	24.90	28.50
†7 x 12½	4.00	4.60	5.00	5.75	30.70	35.50
8 x 13½	4.60	5.30	5.75	6.65	34.00	39.00
†9 x 15	5.75	6.55	7.20	8.20	.....	.....
10 x 16	6.75	7.75	8.45	9.70	52.00	58.00
12 x 19	9.75	10.90	12.20	13.65	70.00	77.00
14 x 21	13.50	14.85	16.90	18.60	85.00	92.50
†15 x 22¼	17.00	18.70	21.25	23.40	.....	.....
16 x 23½	20.00	21.80	25.00	27.25	115.00	126.00
18 x 25	24.00	26.00	30.00	32.50	.....	.....
20 x 27½	28.00	30.50	35.00	38.15	.....	.....
†22 x 29½	33.00	36.00	41.25	45.00	.....	.....
24 x 32	40.00	43.50	50.00	54.45	.....	.....
26 x 34¼	62.50	70.00	78.15	87.50	.....	.....
28 x 36½	77.50	85.00	96.90	106.25	.....	.....
30 x 38¾	90.00	100.00	112.50	125.00	.....	.....
32 x 41¾	110.00	120.00	137.50	150.00	.....	.....
34 x 43¾	122.50	135.00	153.15	168.75	.....	.....
36 x 46	137.50	150.00	171.90	187.50	.....	.....

†Standard practice of manufacturers urges the discontinuance of these sizes.
When ordering Blind Flanges, always give outside diameter.
Order by Figure Number.

FLANGES

*Extra Heavy Blind Flanges**Cast Iron, High-Test Gray-Iron (Semi-Steel), Cast Steel and Forged Steel**For 250 Lbs. Steam Pressure*

Blind Flange

LIST PRICES

Size of Valve or Fitting and O. D. of Flange Inches	CAST IRON Fig. No. 1021		HIGH-TEST GRAY- IRON (SEMI-STEEL) Fig. No. 1022		CAST STEEL SERIES 25 Fig. No. 1023		FORGED STEEL Fig. No. 1024	
	Faced Each	Faced and Drilled Each	Faced Each	Faced and Drilled Each	Faced Each	Faced and Drilled Each	Faced Each	Faced and Drilled Each
1½ x 6	\$1.65	\$2.00	\$2.05	\$2.50	.....	.....	.....	.....
2 x 6½	1.90	2.25	2.35	2.80	\$8.40	\$10.00	\$12.00	\$12.60
†2½ x 7½	2.10	2.45	2.60	3.05	8.80	11.00	13.50	14.70
3 x 8¼	2.40	2.85	3.00	3.55	10.70	14.00	15.75	17.05
3½ x 9	3.00	3.55	3.75	4.45	14.60	18.00	20.25	21.65
4 x 10	3.35	4.05	4.20	5.10	18.30	22.00	22.00	23.70
†4½ x 10½	3.60	4.30	4.50	5.40	19.80	23.50	24.50	26.20
5 x 11	4.00	4.70	5.00	5.90	20.80	24.50	26.50	28.20
6 x 12½	5.00	5.75	6.25	7.20	24.90	29.50	30.00	31.60
†7 x 14	6.60	7.50	8.25	9.35	30.70	36.50	.....	.....
8 x 15	7.65	8.70	9.60	10.90	34.00	40.00	.....	.....
†9 x 16¼	9.50	10.70	11.90	13.40	37.00	43.00	.....	.....
10 x 17½	11.00	12.50	13.75	15.50	52.00	59.00	.....	.....
12 x 20½	16.00	17.75	20.00	22.00	70.00	78.00	.....	.....
14 x 23	22.50	24.50	28.00	30.50	85.00	95.00	.....	.....
†15 x 24½	28.50	31.00	35.50	38.50	94.00	105.00	.....	.....
16 x 25½	33.50	36.25	42.00	45.00	115.00	127.00	.....	.....
18 x 28	39.00	42.00	48.50	52.00	145.00	158.00	.....	.....
20 x 30½	46.00	50.00	57.50	62.50	175.00	189.00	.....	.....
†22 x 33	54.00	59.00	68.00	74.00	210.00	227.00	.....	.....
24 x 36	67.00	72.00	84.00	90.00	250.00	267.00	.....	.....

†Standard practice of manufacturers urges the discontinuance of these sizes.

Cast Steel Flanges when ordered faced and drilled will be furnished with spot faced bolt holes at prices given above.

When ordering Blind Flanges, always give the outside diameter.
Order by Figure Number.

FLANGES

Extra Heavy Companion Flanges

*Cast Iron, High-Test Gray-Iron (Semi-Steel), Cast Steel, Forged Steel
and Malleable Iron*

For 250 Lbs. Steam Pressure



Flange
Showing Hub



Flange
Showing Raised Face

LIST PRICES

Size Inches	CAST IRON Fig. No. 1025		HIGH-TEST GRAY-IRON (SEMI-STEEL) Fig. No. 1026		MALLEABLE IRON Fig. No. 1027		*CAST STEEL SERIES 25 Fig. No. 1028		FORGED STEEL 250 LB. STANDARD Fig. No. 1029	
	Faced Each	Faced and Drilled Each	Faced Each	Faced and Drilled Each	Faced Each	Faced and Drilled Each	Faced Each	Faced and Drilled Each	Faced Each	Faced and Drilled Each
1 x 4½	.95	1.30	1.20	1.65	.....	.....	5.00	6.50	7.50	8.00
1¼ x 5	1.00	1.35	1.25	1.70	.....	.....	5.40	7.00	8.40	9.00
1½ x 6	1.10	1.45	1.35	1.80	2.20	2.90	5.90	7.50	9.40	10.00
2 x 6½	1.25	1.60	1.55	2.00	2.50	3.20	6.90	8.50	10.40	11.00
2½ x 7½	1.40	1.75	1.75	2.20	2.80	3.50	7.30	9.50	11.80	13.00
3 x 8¼	1.60	2.05	2.00	2.55	3.20	4.10	8.70	12.00	13.70	15.00
3½ x 9	2.00	2.55	2.50	3.20	4.00	5.10	12.10	15.50	17.60	19.00
4 x 10	2.25	2.95	2.80	3.70	4.50	5.90	14.80	18.50	18.30	20.00
†4½ x 10½	2.40	3.10	3.00	3.90	4.80	6.20	15.80	19.50	20.30	22.00
5 x 11	2.65	3.35	3.30	4.20	5.30	6.70	16.80	20.50	22.30	24.00
6 x 12½	3.30	4.05	4.10	5.05	6.60	8.10	20.40	25.00	25.40	27.00
†7 x 14	4.40	5.30	5.50	6.60	8.80	10.60	24.70	30.50	27.20	32.00
8 x 15	5.10	6.15	6.40	7.70	10.20	12.30	27.00	33.00	32.00	35.00
†9 x 16¼	6.30	7.50	7.90	9.40	12.60	15.00	29.50	35.50	37.00	40.00
10 x 17½	7.40	8.90	9.25	11.00	14.80	17.80	34.50	41.50	45.00	48.00
12 x 20½	10.75	12.50	13.50	15.50	21.50	25.00	46.00	54.00	56.00	60.00
14 x 23	15.00	17.00	18.50	21.00	30.00	34.00	55.50	65.00	75.50	80.00
†15 x 24½	19.00	21.50	24.00	27.00	38.00	43.00	64.00	75.00	84.00	90.00
16 x 25½	22.25	25.00	28.00	31.00	44.50	50.00	78.00	90.00	93.00	100.00
18 x 28	26.00	29.00	32.50	36.00	.....	.....	98.00	111.00	118.00	125.00
20 x 30½	31.00	35.00	39.00	44.00	.....	.....	117.00	131.00	142.00	150.00
†22 x 33	36.00	41.00	45.00	51.00	.....	.....	140.00	157.50	.....	.....
24 x 36	45.00	50.00	56.00	62.00	.....	.....	165.00	182.00	.....	.....

*Cast Steel Flanges when ordered faced and drilled, will always be furnished with bolt holes spot faced, at the prices given above.

†Standard practice of manufacturers urges the discontinuance of these sizes.
 Sizes 14-inch and larger are tapped to be used with O.D. pipe of the same sizes.
 For galvanized list prices, see page 265.
 Order by Figure Number.

FLANGES

Extra Heavy Cast Iron Flanges

Reducing Companion Flanges

For 250 Lbs. Steam Pressure

400 Lbs. Water Pressure

Reducing Companion Flange
Fig. No. 1030Eccentric Reducing Flange
Fig. No. 1031

Prices on Application

LIST PRICES—CAST IRON—Fig. No. 1030

Size Inches	Faced Each	Faced and Drilled Each	Size Inches	Faced Each	Faced and Drilled Each	Size Inches	Faced Each	Faced and Drilled Each
1 1/4 x 6	1.80	2.15	2 x 14	7.25	8.15	3 1/2 x 20 1/2	17.50	19.25
1 1/2 x 6 1/2	2.10	2.45	2 1/2 x 14	7.25	8.15	4 x 20 1/2	17.50	19.25
1 1/2 x 7 1/2	2.30	2.65	3 x 14	7.25	8.15	5 x 20 1/2	17.50	19.25
2 x 7 1/2	2.30	2.65	3 1/2 x 14	7.25	8.15	6 x 20 1/2	17.50	19.25
1 1/2 x 8 1/4	2.65	3.10	4 x 14	7.25	8.15	†7 x 20 1/2	17.50	19.25
2 x 8 1/4	2.65	3.10	†4 1/2 x 14	7.25	8.15	8 x 20 1/2	17.50	19.25
2 1/2 x 8 1/4	2.65	3.10	5 x 14	7.25	8.15	†9 x 20 1/2	17.50	19.25
1 1/2 x 9	3.30	3.85	6 x 14	7.25	8.15	10 x 20 1/2	17.50	19.25
2 x 9	3.30	3.85	1 1/2 x 15	8.40	9.45	6 x 23	25.00	27.00
2 1/2 x 9	3.30	3.85	2 x 15	8.40	9.45	8 x 23	25.00	27.00
3 x 9	3.30	3.85	2 1/2 x 15	8.40	9.45	†9 x 23	25.00	27.00
1 1/2 x 10	3.70	4.40	3 x 15	8.40	9.45	10 x 23	25.00	27.00
2 x 10	3.70	4.40	3 1/2 x 15	8.40	9.45	12 x 23	25.00	27.00
3 x 10	3.70	4.40	4 x 15	8.40	9.45	8 x 24 1/2	31.50	34.00
3 1/2 x 10	3.70	4.40	†4 1/2 x 15	8.40	9.45	10 x 24 1/2	31.50	34.00
1 1/2 x 10 1/2	4.00	4.70	5 x 15	8.40	9.45	12 x 24 1/2	31.50	34.00
2 x 10 1/2	4.00	4.70	6 x 15	8.40	9.45	14 x 24 1/2	31.50	34.00
2 1/2 x 10 1/2	4.00	4.70	†7 x 15	8.40	9.45	10 x 25 1/2	37.00	39.75
3 x 10 1/2	4.00	4.70	3 x 16 1/4	10.50	11.70	12 x 25 1/2	37.00	39.75
3 1/2 x 10 1/2	4.00	4.70	4 x 16 1/4	10.50	11.70	14 x 25 1/2	37.00	39.75
4 x 10 1/2	4.00	4.70	5 x 16 1/4	10.50	11.70	†15 x 25 1/2	37.00	39.75
1 1/2 x 11	4.40	5.10	6 x 16 1/4	10.50	11.70	12 x 28	43.00	46.00
2 x 11	4.40	5.10	†7 x 16 1/4	10.50	11.70	14 x 28	43.00	46.00
2 1/2 x 11	4.40	5.10	8 x 16 1/4	10.50	11.70	†15 x 28	43.00	46.00
3 x 11	4.40	5.10	2 x 17 1/2	12.00	13.50	16 x 28	43.00	46.00
3 1/2 x 11	4.40	5.10	2 1/2 x 17 1/2	12.00	13.50	14 x 30 1/2	51.00	55.00
4 x 11	4.40	5.10	3 x 17 1/2	12.00	13.50	†15 x 30 1/2	51.00	55.00
†4 1/2 x 11	4.40	5.10	4 x 17 1/2	12.00	13.50	16 x 30 1/2	51.00	55.00
1 1/2 x 12 1/2	5.50	6.25	5 x 17 1/2	12.00	13.50	18 x 30 1/2	51.00	55.00
2 x 12 1/2	5.50	6.25	6 x 17 1/2	12.00	13.50	16 x 33	60.00	65.00
2 1/2 x 12 1/2	5.50	6.25	†7 x 17 1/2	12.00	13.50	18 x 33	60.00	65.00
3 x 12 1/2	5.50	6.25	8 x 17 1/2	12.00	13.50	20 x 33	60.00	65.00
4 x 12 1/2	5.50	6.25	†9 x 17 1/2	12.00	13.50	18 x 36	74.00	79.00
†4 1/2 x 12 1/2	5.50	6.25	2 1/2 x 20 1/2	17.50	19.25	20 x 36	74.00	79.00
5 x 12 1/2	5.50	6.25	3 x 20 1/2	17.50	19.25	.....	.....	.....

Made in High-Test Gray-Iron (Semi-Steel) at an advance of 25%.

†Standard practice of manufacturers urges the discontinuance of these sizes.

For galvanized list prices, see page 265.

Eccentric reducing companion flanges furnished to order. Prices on application.

Order by Figure Number.

FLANGES

Extra Heavy Cast Steel Flanges
Reducing Companion Flanges—Series 25

For 250 Lbs. W. S. P. and a Total Temperature of 750 Degrees



Reducing Companion Flange
Fig. No. 1032

LIST PRICES

Size Inches	Faced Each	Faced, Drilled and Spot Faced Each	Size Inches	Faced Each	Faced, Drilled and Spot Faced Each	Size Inches	Faced Each	Faced, Drilled and Spot Faced Each
1 1/4 x 6	8.85	10.45	3 x 12 1/2	30.90	35.50	10 x 20 1/2	70.00	78.00
1 1/2 x 6 1/2	10.25	11.85	4 x 12 1/2	30.90	35.50	8 x 23	85.00	95.00
1 1/2 x 7 1/2	10.80	13.00	† 4 1/2 x 12 1/2	30.90	35.50	† 9 x 23	85.00	95.00
2 x 7 1/2	10.80	13.00	5 x 12 1/2	30.90	35.50	10 x 23	85.00	95.00
1 1/2 x 8 1/4	12.70	16.00	† 4 1/2 x 14	36.70	42.50	12 x 23	85.00	95.00
2 x 8 1/4	12.70	16.00	5 x 14	36.70	42.50	8 x 24 1/2	94.00	105.00
2 1/2 x 8 1/4	12.70	16.00	6 x 14	36.70	42.50	10 x 24 1/2	94.00	105.00
2 x 9	18.10	21.50	3 x 15	40.00	46.00	12 x 24 1/2	94.00	105.00
2 1/2 x 9	18.10	21.50	3 1/2 x 15	40.00	46.00	14 x 24 1/2	94.00	105.00
3 x 9	18.10	21.50	4 x 15	40.00	46.00	10 x 25 1/2	115.00	127.00
2 x 10	21.80	25.50	5 x 15	40.00	46.00	12 x 25 1/2	115.00	127.00
2 1/2 x 10	21.80	25.50	6 x 15	40.00	46.00	14 x 25 1/2	115.00	127.00
3 x 10	21.80	25.50	† 7 x 15	40.00	46.00	† 15 x 25 1/2	115.00	127.00
3 1/2 x 10	21.80	25.50	4 x 16 1/4	44.00	50.00	12 x 28	145.00	158.00
2 x 10 1/2	23.80	27.50	5 x 16 1/4	44.00	50.00	14 x 28	145.00	158.00
2 1/2 x 10 1/2	23.80	27.50	6 x 16 1/4	44.00	50.00	† 15 x 28	145.00	158.00
3 x 10 1/2	23.80	27.50	† 7 x 16 1/4	44.00	50.00	16 x 28	145.00	158.00
3 1/2 x 10 1/2	23.80	27.50	8 x 16 1/4	44.00	50.00	14 x 30 1/2	175.00	189.00
4 x 10 1/2	23.80	27.50	5 x 17 1/2	52.00	59.00	† 15 x 30 1/2	175.00	189.00
2 x 11	24.80	28.50	6 x 17 1/2	52.00	59.00	16 x 30 1/2	175.00	189.00
2 1/2 x 11	24.80	28.50	† 7 x 17 1/2	52.00	59.00	18 x 30 1/2	175.00	189.00
3 x 11	24.80	28.50	8 x 17 1/2	52.00	59.00	16 x 33	210.00	227.00
3 1/2 x 11	24.80	28.50	† 9 x 17 1/2	52.00	59.00	18 x 33	210.00	227.00
4 x 11	24.80	28.50	† 6 x 20 1/2	70.00	78.00	20 x 33	210.00	227.00
† 4 1/2 x 11	24.80	28.50	† 7 x 20 1/2	70.00	78.00	18 x 36	250.00	267.00
2 x 12 1/2	30.90	35.50	8 x 20 1/2	70.00	78.00	20 x 36	250.00	267.00
2 1/2 x 12 1/2	30.90	35.50	† 9 x 20 1/2	70.00	78.00			

Sizes 14-inch and larger are tapped to be used with O.D. Pipe of same size.

Cast Steel Reducing Flanges when ordered faced and drilled will be furnished with spot faced bolt holes at above prices.

†Standard practice of manufacturers urges the discontinuance of these sizes.

See instructions and remarks for ordering Reducing Flanges on page 266.

Order by Figure Number.

FLANGES

Steel Flanges—Series 40 (400 Pounds W. S. P.)

Companion—Blind—Reducing

For 400 Lbs. W. S. P. at a Total Temperature of 750 Degrees

LIST PRICES

Size of Valve or Fitting and O.D. of Flange, Inches	SCREWED COMPANION FLANGES		BLIND FLANGES		CAST STEEL REDUCING SCREWED COMPANION FLANGES Fig. No. 1080			
	Cast Steel No. 1076	Forged Steel No. 1077	Cast Steel No. 1078	Forged Steel No. 1079	Size, Inches	Faced, Drilled add Spot Faced Each	Size, Inches	Faced, Drilled and Spot Faced Each
	Faced, Drilled and Spot Faced Each	Faced, Drilled and Spot Faced Each	Faced, Drilled and Spot Faced Each	Faced, Drilled and Spot Faced Each				
2 x 6½	Use Series 60	11.00	Use Series 60	12.60	1½ x 7½	13.00	†5 x 14	42.50
2½ x 7½		13.00		14.70	2 x 7½	13.00	†6 x 14	42.50
3 x 8¼		15.00		17.05	1½ x 8¼	16.00	3 x 15	46.00
4 x 9		19.00		21.65	2 x 8¼	16.00	3½ x 15	46.00
5 x 10		20.00	22.00	23.70	2½ x 8¼	16.00	4 x 15	46.00
6 x 10½		22.00	23.50	26.20	2 x 9	21.50	5 x 15	46.00
8 x 11		24.00	24.50	28.20	2½ x 9	21.50	6 x 15	46.00
10 x 12½		27.00	29.50	31.60	3 x 9	21.50	†7 x 15	46.00
12 x 14		32.00	36.50	.....	2 x 10	25.50	5 x 17½	59.00
15 x 15		35.00	40.00	.....	2½ x 10	25.50	6 x 17½	59.00
17½ x 20½		48.00	59.00	.....	3 x 10	25.50	†7 x 17½	59.00
23 x 25½		60.00	78.00	.....	3½ x 10	25.50	8 x 17½	59.00
28 x 30½		.....	95.00	.....	†2 x 10½	27.50	6 x 20½	78.00
36 x 36		.....	127.00	.....	†2½ x 10½	27.50	†7 x 20½	78.00
			158.00	.....	†3 x 10½	27.50	8 x 20½	78.00
			189.00	.....	†3½ x 10½	27.50	10 x 20½	78.00
			267.00	.....	†4 x 10½	27.50	8 x 23	95.00
					2 x 11	28.50	10 x 23	95.00
					2½ x 11	28.50	12 x 23	95.00
					3 x 11	28.50	10 x 25½	127.00
					3½ x 11	28.50	12 x 25½	127.00
					4 x 11	28.50	14 x 25½	127.00
					†4½ x 11	28.50	12 x 28	158.00
					2 x 12½	35.50	14 x 28	158.00
					2½ x 12½	35.50	16 x 28	158.00
					3 x 12½	35.50	14 x 30½	189.00
					4 x 12½	35.50	16 x 30½	189.00
					†4½ x 12½	35.50	18 x 30½	189.00
					5 x 12½	35.50	18 x 36	267.00
					†4½ x 14	42.50	20 x 36	267.00

Sizes 14-inch and larger are tapped to be used with O.D. Pipe of same size.

†Standard practice of manufacturers urges the discontinuance of these sizes.

For Dimensions and Drilling, see pages 310 and 311.

See Notes on pages 280, 281 and 294.

See instructions and remarks for ordering Reducing Flanges on page 266.

Order by Figure Number.

FLANGES

Cast Steel Flanges

Companion — Blind

Series 60 (600 Pounds W. S. P.)

For 600 Lbs. W. S. P. and a Total Temperature of 750 Degrees

Series 90 (900 Pounds W. S. P.)

For 900 Lbs. W. S. P. and a Total Temperature of 750 Degrees

LIST PRICES

SERIES 60			SERIES 90		
Size of Valve or Fitting and O. D. of Flange, Inches	Screwed Companion Flanges Fig. No. 1081 Faced, Drilled and Spot Faced Each	Blind Flanges Fig. No. 1082 Faced, Drilled and Spot Faced Each	Size of Valve or Fitting and O. D. of Flange, Inches	Screwed Companion Flanges Fig. No. 1086 Faced, Drilled and Spot Faced Each	Blind Flanges Fig. No. 1087 Faced, Drilled and Spot Faced Each
$\frac{3}{4}$ x $4\frac{5}{8}$	6.50	7.75	.....	.....	.....
1 x $4\frac{7}{8}$	6.85	8.20	1 x $5\frac{7}{8}$	10.00	11.75
† $1\frac{1}{4}$ x $5\frac{1}{4}$	7.30	8.80	† $1\frac{1}{4}$ x $6\frac{1}{4}$	10.75	12.65
$1\frac{1}{2}$ x $6\frac{1}{8}$	8.00	9.45	$1\frac{1}{2}$ x 7	12.00	13.90
2 x $6\frac{1}{2}$	9.00	10.60	2 x $7\frac{1}{2}$	13.60	15.85
$2\frac{1}{2}$ x $7\frac{1}{2}$	11.00	12.75	$2\frac{1}{2}$ x $8\frac{1}{2}$	17.25	20.25
3 x $8\frac{1}{4}$	14.00	16.25	3 x $9\frac{1}{2}$	21.50	25.25
$3\frac{1}{2}$ x 9	16.50	19.25	$3\frac{1}{2}$ x $10\frac{3}{4}$	26.25	30.75
4 x $10\frac{3}{4}$	20.75	24.25	4 x $11\frac{1}{2}$	32.00	38.25
† $4\frac{1}{2}$ x $11\frac{1}{2}$	24.00	29.50	† $4\frac{1}{2}$ x 13	38.00	47.00
5 x 13	30.50	37.00	5 x $13\frac{3}{4}$	47.00	58.00
6 x 14	36.00	44.00	6 x 15	56.50	70.50
† 7 x 15	43.50	54.00	† 7 x $16\frac{1}{2}$	69.00	88.00
8 x $16\frac{1}{2}$	53.00	67.00	8 x $18\frac{1}{2}$	88.00	113.00
10 x 20	80.00	107.00	10 x $21\frac{1}{2}$	120.00	161.00
12 x 22	93.00	134.00	12 x 24	156.00	218.00
14 x $23\frac{3}{4}$	110.00	164.00	14 x $25\frac{1}{4}$	179.00	261.00
16 x 27	141.00	209.00	16 x $27\frac{3}{4}$	205.00	310.00

Sizes 14-inch and larger are tapped to be used with O.D. Pipe of same size.

†Standard practice of manufacturers urges the discontinuance of these sizes.

For Dimensions and Drilling, see pages 312, 313, or 314, 315.

See Notes on pages 280, 281 and 294.

Order by Figure Number.

FLANGES

*Cast Iron Lap Joint Flanges**Standard for 125 Lbs. Steam Pressure**Extra Heavy for 250 Lbs. Steam Pressure*

Standard, High Hub
Fig. No. 1033



Extra Heavy, High Hub
Fig. No. 1034

STANDARD, HIGH HUB—Fig. No. 1033

EX.HEAVY, HIGH HUB—Fig. No. 1034

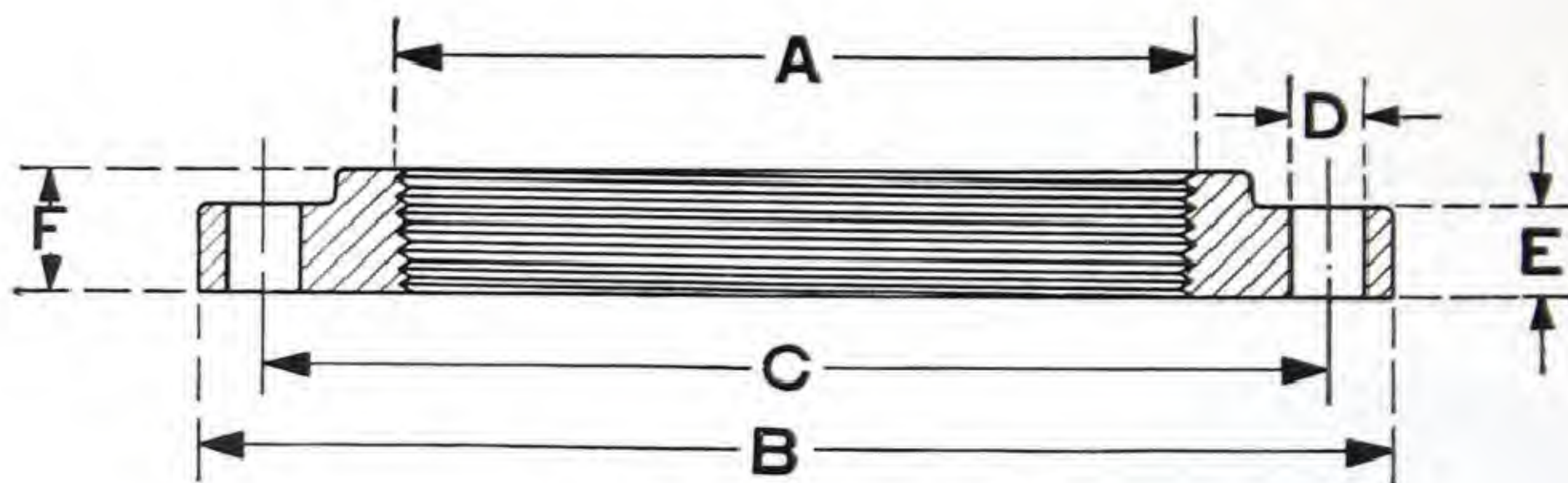
Size Inches	Diam. of Flange Inches	Price Faced	Price Faced and Drilled	Size Inches	Diam. of Flange Inches	Price Faced	Price Faced and Drilled
4	9	4.05	4.50	4	10	4.80	5.50
†4½	9¼	4.05	4.50	†4½	10½	5.05	5.75
5	10	4.30	4.75	5	11	5.30	6.00
6	11	4.75	5.25	6	12½	6.25	7.00
†7	12½	5.65	6.25	†7	14	7.10	8.00
8	13½	6.05	6.75	8	15	7.95	9.00
†9	15	7.20	8.00	†9	16¼	9.05	10.25
10	16	8.00	9.00	10	17½	10.75	12.25
12	19	8.85	10.00	12	20½	12.50	14.25
14	21	10.65	12.00	14	23	15.00	17.00
†15	22¼	11.30	13.00	†15	24½	16.50	19.00
16	23½	12.20	14.00	16	25½	18.25	21.00
18	25	15.00	17.00	18	28	20.00	23.00
20	27½	17.50	20.00	20	30½	24.00	28.00

Standard Lap Joint Flanges can also be furnished in Forged Steel.
Prices on application.

†Standard practice of manufacturers urges the discontinuance of these sizes.

Order by Figure Number.

DIMENSIONS

*Standard Companion Flanges**Cast Iron, High-Test Gray-Iron (Semi-Steel)**Cast Steel, Forged Steel, Malleable Iron*

Standard Companion Flanges

DIMENSIONS

Pipe Size A	B	C	D	E	F	No. of Bolts	Size of Bolts	Length of Bolts
1	4	3	$\frac{9}{16}$	$\frac{7}{16}$	$\frac{11}{16}$	4	$\frac{7}{16}$	$1\frac{1}{2}$
$1\frac{1}{4}$	$4\frac{1}{2}$	$3\frac{3}{8}$	$\frac{9}{16}$	$\frac{1}{2}$	$\frac{3}{4}$	4	$\frac{7}{16}$	$1\frac{1}{2}$
$1\frac{1}{2}$	5	$3\frac{7}{8}$	$\frac{5}{8}$	$\frac{9}{16}$	$\frac{7}{8}$	4	$\frac{1}{2}$	$1\frac{3}{4}$
2	6	$4\frac{3}{4}$	$\frac{3}{4}$	$\frac{5}{8}$	1	4	$\frac{5}{8}$	2
$2\frac{1}{2}$	7	$5\frac{1}{2}$	$\frac{3}{4}$	$\frac{11}{16}$	$1\frac{1}{8}$	4	$\frac{5}{8}$	$2\frac{1}{4}$
3	$7\frac{1}{2}$	6	$\frac{3}{4}$	$\frac{3}{4}$	$1\frac{3}{16}$	4	$\frac{5}{8}$	$2\frac{1}{4}$
$3\frac{1}{2}$	$8\frac{1}{2}$	7	$\frac{3}{4}$	$\frac{13}{16}$	$1\frac{1}{4}$	4	$\frac{5}{8}$	$2\frac{1}{2}$
4	9	$7\frac{1}{2}$	$\frac{3}{4}$	$\frac{15}{16}$	$1\frac{5}{16}$	8	$\frac{5}{8}$	$2\frac{3}{4}$
$\dagger 4\frac{1}{2}$	$9\frac{1}{4}$	$7\frac{3}{4}$	$\frac{7}{8}$	$\frac{15}{16}$	$1\frac{3}{8}$	8	$\frac{3}{4}$	$2\frac{3}{4}$
5	10	$8\frac{1}{2}$	$\frac{7}{8}$	$\frac{15}{16}$	$1\frac{7}{16}$	8	$\frac{3}{4}$	$2\frac{3}{4}$
6	11	$9\frac{1}{2}$	$\frac{7}{8}$	1	$1\frac{1}{2}$	8	$\frac{3}{4}$	3
$\dagger 7$	$12\frac{1}{2}$	$10\frac{3}{4}$	$\frac{7}{8}$	$1\frac{1}{16}$	$1\frac{5}{8}$	8	$\frac{3}{4}$	3
8	$13\frac{1}{2}$	$11\frac{3}{4}$	$\frac{7}{8}$	$1\frac{1}{8}$	$1\frac{11}{16}$	8	$\frac{3}{4}$	$3\frac{1}{4}$
$\dagger 9$	15	$13\frac{1}{4}$	$\frac{7}{8}$	$1\frac{1}{8}$	$1\frac{13}{16}$	12	$\frac{3}{4}$	$3\frac{1}{4}$
10	16	$14\frac{1}{4}$	1	$1\frac{3}{16}$	$1\frac{15}{16}$	12	$\frac{7}{8}$	$3\frac{1}{2}$
12	19	17	1	$1\frac{1}{4}$	$2\frac{1}{8}$	12	$\frac{7}{8}$	$3\frac{1}{2}$
14	21	$18\frac{3}{4}$	$1\frac{1}{8}$	$1\frac{3}{8}$	$2\frac{1}{4}$	12	1	4
$\dagger 15$	$22\frac{1}{4}$	20	$1\frac{1}{8}$	$1\frac{3}{8}$	$2\frac{3}{8}$	16	1	4
16	$23\frac{1}{2}$	$21\frac{1}{4}$	$1\frac{1}{8}$	$1\frac{7}{16}$	$2\frac{7}{16}$	16	1	4
18	25	$22\frac{3}{4}$	$1\frac{1}{4}$	$1\frac{9}{16}$	$2\frac{5}{8}$	16	$1\frac{1}{8}$	$4\frac{1}{2}$
20	$27\frac{1}{2}$	25	$1\frac{1}{4}$	$1\frac{11}{16}$	$2\frac{7}{8}$	20	$1\frac{1}{8}$	$4\frac{3}{4}$
$\dagger 22$	$29\frac{1}{2}$	$27\frac{1}{4}$	$1\frac{3}{8}$	$1\frac{13}{16}$	$3\frac{1}{16}$	20	$1\frac{1}{4}$	5
24	32	$29\frac{1}{2}$	$1\frac{3}{8}$	$1\frac{7}{8}$	$3\frac{1}{4}$	20	$1\frac{1}{4}$	$5\frac{1}{4}$

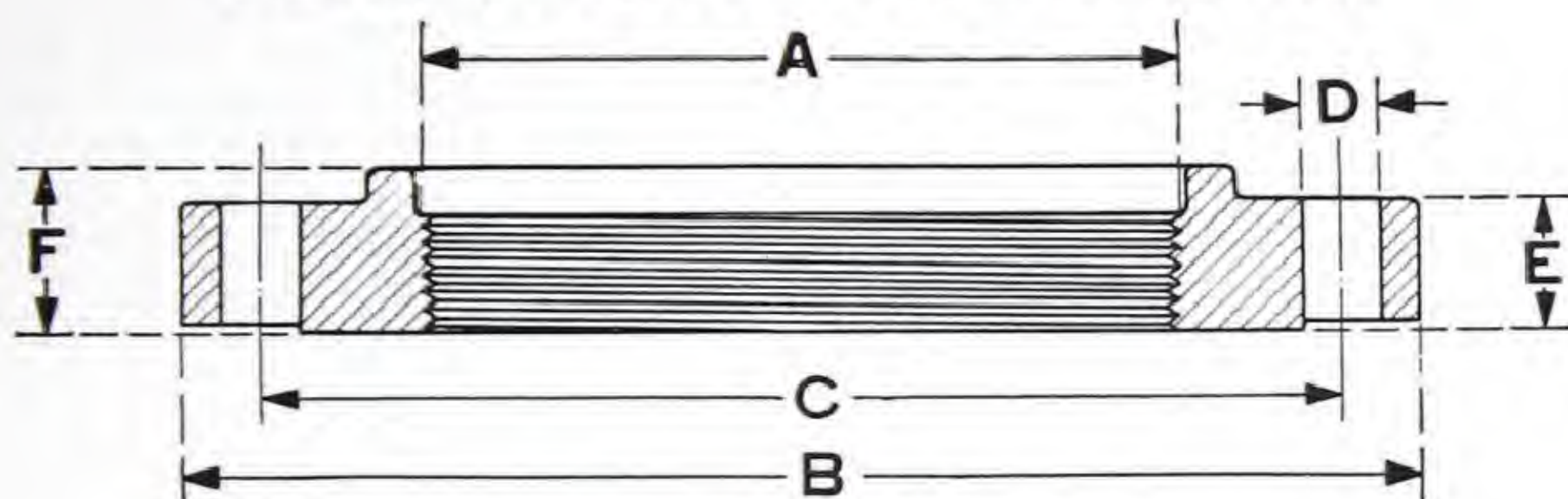
Sizes 14 to 24-inch are outside diameter of pipe.

\dagger Standard practice of manufacturers urges the discontinuance of these sizes.

DIMENSIONS

Extra Heavy Companion Flanges

Cast Iron, High-Test Gray-Iron (Semi-Steel)
Cast Steel, Forged Steel and Malleable Iron



Extra Heavy Companion Flanges

DIMENSIONS

Pipe Size A	B	C	D	E	F	No. of Bolts	Size of Bolts	Length of Bolts
1	4½	3¼	5/8	11/16	1	4	1/2	2
1¼	5	3¾	5/8	3/4	1 1/16	4	1/2	2¼
1½	6	4½	3/4	13/16	1 3/16	4	5/8	2½
2	6½	5	3/4	7/8	1 5/16	4	5/8	2½
2½	7½	5 7/8	7/8	1	1 1/2	4	3/4	3
3	8¼	6 5/8	7/8	1 1/8	1 9/16	8	3/4	3¼
3½	9	7¼	7/8	1 3/16	1 5/8	8	3/4	3¼
4	10	7 7/8	7/8	1 1/4	1 3/4	8	3/4	3½
† 4½	10½	8½	7/8	1 5/16	1 13/16	8	3/4	3½
5	11	9¼	7/8	1 3/8	1 7/8	8	3/4	3¾
6	12½	10 5/8	7/8	1 7/16	1 15/16	12	3/4	3¾
† 7	14	11 7/8	1	1 1/2	2 1/16	12	7/8	4
8	15	13	1	1 5/8	2 3/16	12	7/8	4¼
† 9	16¼	14	1 1/8	1 3/4	2 1/4	12	1	4¾
10	17½	15¼	1 1/8	1 7/8	2 3/8	16	1	5
12	20½	17¾	1 1/4	2	2 9/16	16	1 1/8	5¼
14	23	20¼	1 1/4	2 1/8	2 11/16	20	1 1/8	5½
† 15	24½	21½	1 3/8	2 3/16	2 13/16	20	1 1/4	5¾
16	25½	22½	1 3/8	2 1/4	2 7/8	20	1 1/4	6
18	28	24¾	1 3/8	2 3/8	3 1/8	24	1 1/4	6¼
20	30½	27	1 1/2	2 1/2	3 5/16	24	1 3/8	6½
† 22	33	29¼	1 5/8	2 5/8	3 1/2	24	1 1/2	7
24	36	32	1 3/4	2 3/4	3 11/16	24	1 5/8	7½

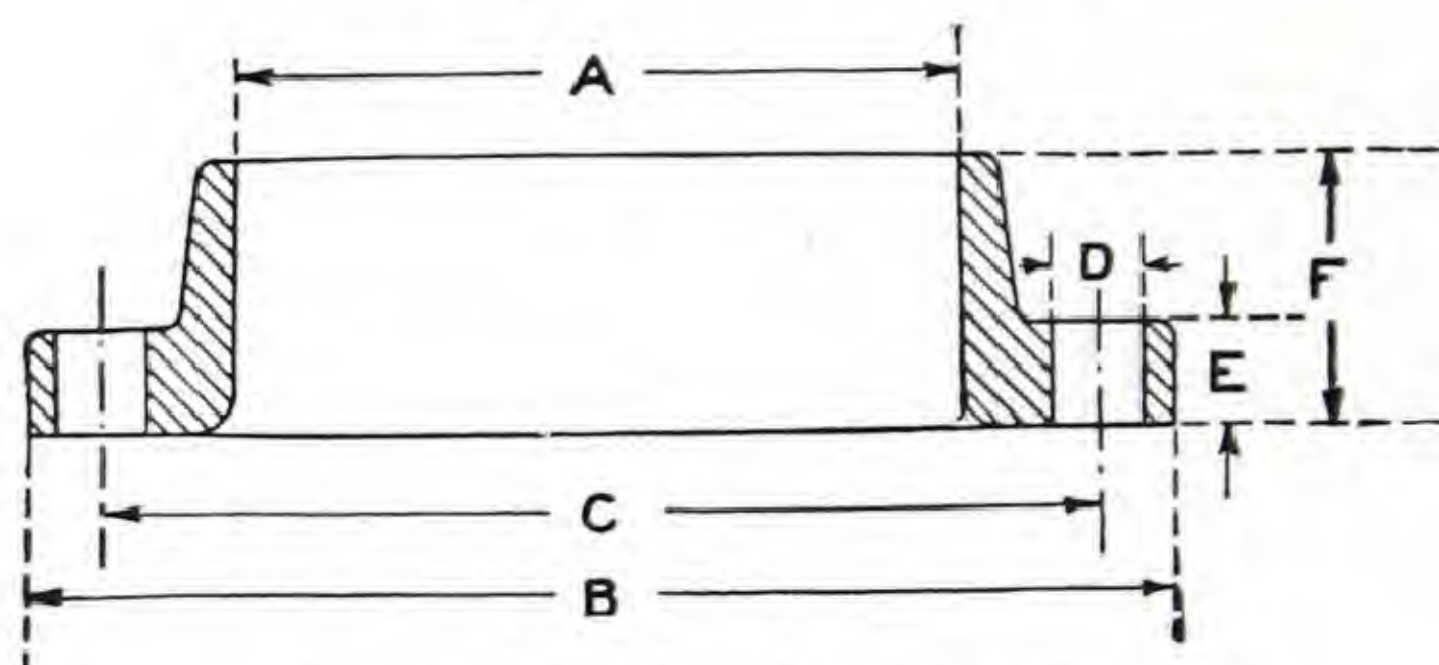
Sizes 14 to 24-inch are outside diameter of pipe.

†Standard practice of manufacturers urges the discontinuance of these sizes.

DIMENSIONS

Standard Cast Iron Grinnell Lap Joint Flanges

For 125 Lbs. Steam Pressure

Standard Cast Iron Lap Joint Flange
High Hub

DIMENSIONS

Pipe Size	A	B	C	D	E	F	No. of Bolts	Size of Bolts	Length of Bolts
4	$4\frac{5}{8}$	9	$7\frac{1}{2}$	$\frac{3}{4}$	$\frac{15}{16}$	$2\frac{7}{16}$	8	$\frac{5}{8}$	3
†4½	$5\frac{1}{8}$	$9\frac{1}{4}$	$7\frac{3}{4}$	$\frac{7}{8}$	$\frac{15}{16}$	$2\frac{7}{16}$	8	$\frac{3}{4}$	$3\frac{1}{4}$
5	$5\frac{11}{16}$	10	$8\frac{1}{2}$	$\frac{7}{8}$	$\frac{15}{16}$	$2\frac{9}{16}$	8	$\frac{3}{4}$	$3\frac{1}{4}$
6	$6\frac{3}{4}$	11	$9\frac{1}{2}$	$\frac{7}{8}$	1	$2\frac{5}{8}$	8	$\frac{3}{4}$	$3\frac{1}{2}$
†7	$7\frac{13}{16}$	$12\frac{1}{2}$	$10\frac{3}{4}$	$\frac{7}{8}$	$1\frac{1}{16}$	$2\frac{13}{16}$	8	$\frac{3}{4}$	$3\frac{1}{2}$
8	$8\frac{13}{16}$	$13\frac{1}{2}$	$11\frac{3}{4}$	$\frac{7}{8}$	$1\frac{1}{8}$	$2\frac{7}{8}$	8	$\frac{3}{4}$	$3\frac{3}{4}$
†9	$9\frac{13}{16}$	15	$13\frac{1}{4}$	$\frac{7}{8}$	$1\frac{1}{8}$	$3\frac{1}{8}$	12	$\frac{3}{4}$	$3\frac{3}{4}$
10	$10\frac{15}{16}$	16	$14\frac{1}{4}$	1	$1\frac{3}{16}$	$3\frac{3}{16}$	12	$\frac{7}{8}$	$4\frac{1}{4}$
12	$12\frac{15}{16}$	19	17	1	$1\frac{1}{4}$	$3\frac{1}{2}$	12	$\frac{7}{8}$	$4\frac{1}{4}$
14	$14\frac{1}{4}$	21	$18\frac{3}{4}$	$1\frac{1}{8}$	$1\frac{3}{8}$	$3\frac{3}{4}$	12	1	$4\frac{3}{4}$
†15	$15\frac{1}{4}$	$22\frac{1}{4}$	20	$1\frac{1}{8}$	$1\frac{3}{8}$	$3\frac{7}{8}$	16	1	$4\frac{3}{4}$
16	$16\frac{1}{4}$	$23\frac{1}{2}$	$21\frac{1}{4}$	$1\frac{1}{8}$	$1\frac{7}{16}$	$3\frac{15}{16}$	16	1	$4\frac{3}{4}$
18	$18\frac{5}{16}$	25	$22\frac{3}{4}$	$1\frac{1}{4}$	$1\frac{9}{16}$	$4\frac{5}{16}$	16	$1\frac{1}{8}$	$5\frac{1}{4}$
20	$20\frac{5}{16}$	$27\frac{1}{2}$	25	$1\frac{1}{4}$	$1\frac{11}{16}$	$4\frac{11}{16}$	20	$1\frac{1}{8}$	$5\frac{1}{2}$
†22	$22\frac{5}{16}$	$29\frac{1}{2}$	$27\frac{1}{4}$	$1\frac{3}{8}$	$1\frac{13}{16}$	$5\frac{1}{16}$	20	$1\frac{1}{4}$	$5\frac{3}{4}$
24	$24\frac{5}{16}$	32	$29\frac{1}{2}$	$1\frac{3}{8}$	$1\frac{7}{8}$	$5\frac{1}{8}$	20	$1\frac{1}{4}$	6

Sizes 14 to 24-inch are outside diameter of pipe.

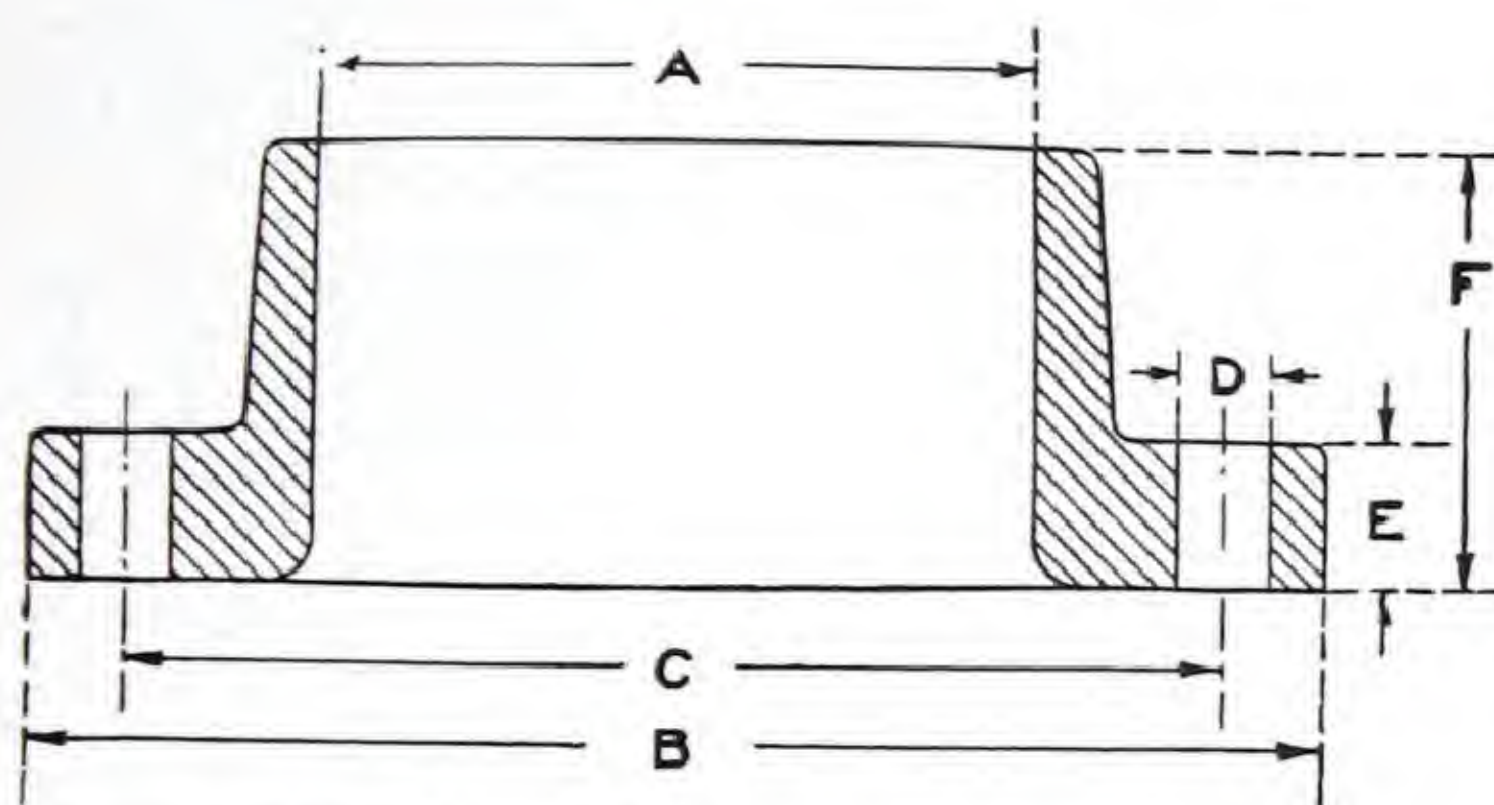
†Standard practice of manufacturers urges the discontinuance of these sizes.

Standard Lap Joint Flanges can also be furnished in forged steel.
Prices and dimensions on application.

DIMENSIONS

Extra Heavy Cast Iron Grinnell Lap Joint Flanges

For 250 Lbs. Steam Pressure

Extra Heavy Cast Iron Lap Joint Flange
High Hub

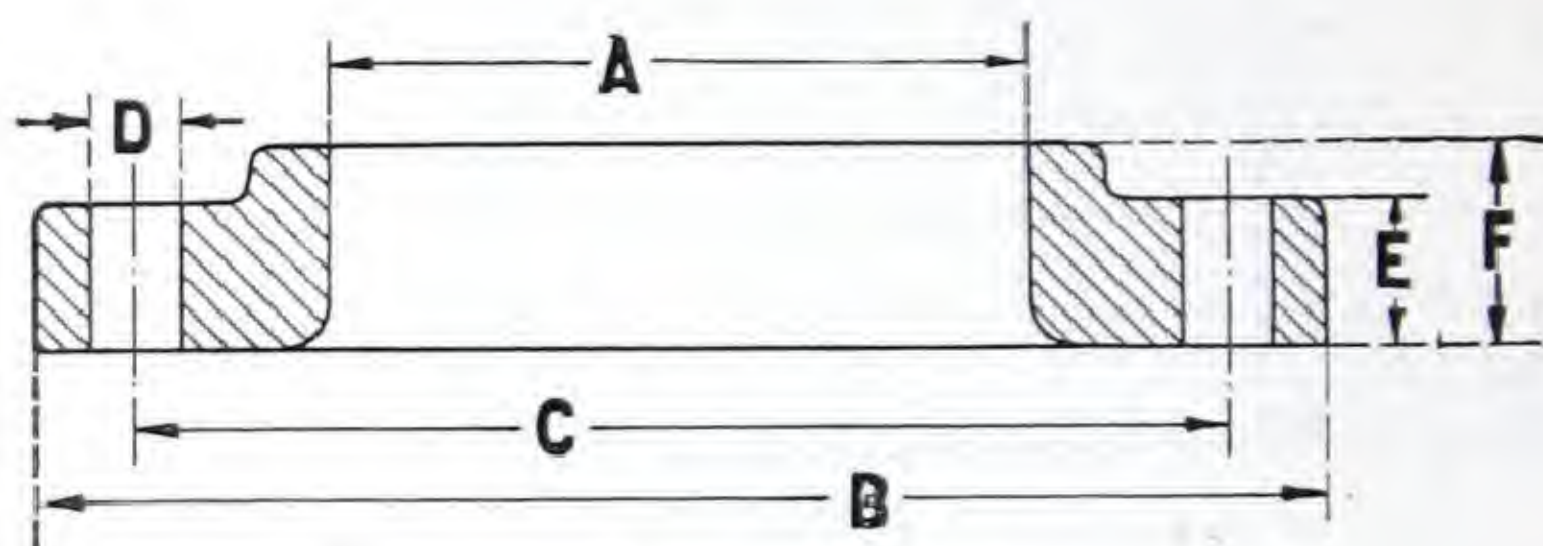
DIMENSIONS

Pipe Size	A	B	C	D	E	F	No. of Bolts	Size of Bolts	Length of Bolts
4	4 $\frac{5}{8}$	10	7 $\frac{7}{8}$	$\frac{7}{8}$	1 $\frac{1}{4}$	3 $\frac{11}{16}$	8	$\frac{3}{4}$	4
†4 $\frac{1}{2}$	5 $\frac{1}{8}$	10 $\frac{1}{2}$	8 $\frac{1}{2}$	$\frac{7}{8}$	1 $\frac{5}{16}$	3 $\frac{7}{8}$	8	$\frac{3}{4}$	4 $\frac{1}{4}$
5	5 $\frac{11}{16}$	11	9 $\frac{1}{4}$	$\frac{7}{8}$	1 $\frac{3}{8}$	4 $\frac{1}{16}$	8	$\frac{3}{4}$	4 $\frac{1}{2}$
6	6 $\frac{3}{4}$	12 $\frac{1}{2}$	10 $\frac{5}{8}$	$\frac{7}{8}$	1 $\frac{7}{16}$	4 $\frac{1}{4}$	12	$\frac{3}{4}$	4 $\frac{3}{4}$
†7	7 $\frac{13}{16}$	14	11 $\frac{7}{8}$	1	1 $\frac{1}{2}$	4 $\frac{7}{16}$	12	$\frac{7}{8}$	5
8	8 $\frac{13}{16}$	15	13	1	1 $\frac{5}{8}$	4 $\frac{5}{8}$	12	$\frac{7}{8}$	5 $\frac{1}{4}$
†9	9 $\frac{13}{16}$	16 $\frac{1}{4}$	14	1 $\frac{1}{8}$	1 $\frac{3}{4}$	4 $\frac{13}{16}$	12	1	5 $\frac{3}{4}$
10	10 $\frac{15}{16}$	17 $\frac{1}{2}$	15 $\frac{1}{4}$	1 $\frac{1}{8}$	1 $\frac{7}{8}$	4 $\frac{15}{16}$	16	1	6
12	12 $\frac{15}{16}$	20 $\frac{1}{2}$	17 $\frac{3}{4}$	1 $\frac{1}{4}$	2	5 $\frac{5}{16}$	16	1 $\frac{1}{8}$	6 $\frac{1}{4}$
14	14 $\frac{1}{4}$	23	20 $\frac{1}{4}$	1 $\frac{1}{4}$	2 $\frac{1}{8}$	5 $\frac{1}{2}$	20	1 $\frac{1}{8}$	6 $\frac{1}{2}$
15	15 $\frac{1}{4}$	24 $\frac{1}{2}$	21 $\frac{1}{2}$	1 $\frac{3}{8}$	2 $\frac{3}{16}$	5 $\frac{5}{8}$	20	1 $\frac{1}{4}$	6 $\frac{3}{4}$
16	16 $\frac{1}{4}$	25 $\frac{1}{2}$	22 $\frac{1}{2}$	1 $\frac{3}{8}$	2 $\frac{1}{4}$	6	20	1 $\frac{1}{4}$	7
18	18 $\frac{5}{16}$	28	24 $\frac{3}{4}$	1 $\frac{3}{8}$	2 $\frac{3}{8}$	6 $\frac{1}{4}$	24	1 $\frac{1}{4}$	7 $\frac{1}{4}$
20	20 $\frac{5}{16}$	30 $\frac{1}{2}$	27	1 $\frac{1}{2}$	2 $\frac{1}{2}$	6 $\frac{1}{2}$	24	1 $\frac{3}{8}$	7 $\frac{1}{2}$
†22	22 $\frac{5}{16}$	33	29 $\frac{1}{4}$	1 $\frac{5}{8}$	2 $\frac{5}{8}$	6 $\frac{7}{8}$	24	1 $\frac{1}{2}$	8
24	24 $\frac{5}{16}$	36	32	1 $\frac{3}{4}$	2 $\frac{3}{4}$	7 $\frac{1}{4}$	24	1 $\frac{5}{8}$	8 $\frac{1}{4}$

Sizes 14 to 24-inch are outside diameter of pipe.

†Standard practice of manufacturers urges the discontinuance of these sizes.

DIMENSIONS

*Extra Heavy Cast Steel Lap Joint Flanges**350 Lbs. W. S. P. at a Total Temperature of 750 Degrees*

Extra Heavy Cast Steel Lap Joint Flange
Low Hub

DIMENSIONS

Pipe Size	A	B	C	D	E	F	No. of Bolts	Size of Bolts	Length of Bolts
4	$4\frac{5}{8}$	10	$7\frac{7}{8}$	$\frac{7}{8}$	$1\frac{1}{4}$	$1\frac{3}{4}$	8	$\frac{3}{4}$	4
†4½	$5\frac{1}{8}$	$10\frac{1}{2}$	$8\frac{1}{2}$	$\frac{7}{8}$	$1\frac{5}{16}$	$1\frac{13}{16}$	8	$\frac{3}{4}$	$4\frac{1}{4}$
5	$5\frac{11}{16}$	11	$9\frac{1}{4}$	$\frac{7}{8}$	$1\frac{3}{8}$	$1\frac{7}{8}$	8	$\frac{3}{4}$	$4\frac{1}{2}$
6	$6\frac{11}{16}$	$12\frac{1}{2}$	$10\frac{5}{8}$	$\frac{7}{8}$	$1\frac{7}{16}$	2	12	$\frac{3}{4}$	$4\frac{3}{4}$
†7	$7\frac{3}{4}$	14	$11\frac{7}{8}$	1	$1\frac{1}{2}$	$2\frac{1}{16}$	12	$\frac{7}{8}$	5
8	$8\frac{3}{4}$	15	13	1	$1\frac{5}{8}$	$2\frac{3}{16}$	12	$\frac{7}{8}$	$5\frac{1}{4}$
10	$10\frac{7}{8}$	$17\frac{1}{2}$	$15\frac{1}{4}$	$1\frac{1}{8}$	$1\frac{7}{8}$	$2\frac{3}{8}$	16	1	6
12	$12\frac{7}{8}$	$20\frac{1}{2}$	$17\frac{3}{4}$	$1\frac{1}{4}$	2	$2\frac{9}{16}$	16	$1\frac{1}{8}$	$6\frac{1}{4}$
14	$14\frac{1}{8}$	23	$20\frac{1}{4}$	$1\frac{1}{4}$	$2\frac{1}{8}$	$2\frac{11}{16}$	20	$1\frac{1}{8}$	$6\frac{1}{2}$
16	$16\frac{1}{8}$	$25\frac{1}{2}$	$22\frac{1}{2}$	$1\frac{3}{8}$	$2\frac{1}{4}$	$2\frac{7}{8}$	20	$1\frac{1}{4}$	7
18	$18\frac{1}{8}$	28	$24\frac{3}{4}$	$1\frac{3}{8}$	$2\frac{3}{8}$	$3\frac{1}{16}$	24	$1\frac{1}{4}$	$7\frac{1}{4}$
20	$20\frac{1}{8}$	$30\frac{1}{2}$	27	$1\frac{1}{2}$	$2\frac{1}{2}$	$3\frac{1}{4}$	24	$1\frac{3}{8}$	$7\frac{1}{2}$
24	$24\frac{1}{8}$	36	32	$1\frac{3}{4}$	$2\frac{3}{4}$	$3\frac{5}{8}$	24	$1\frac{5}{8}$	$8\frac{1}{4}$

Sizes 14 to 24-inch are outside diameter of pipe.

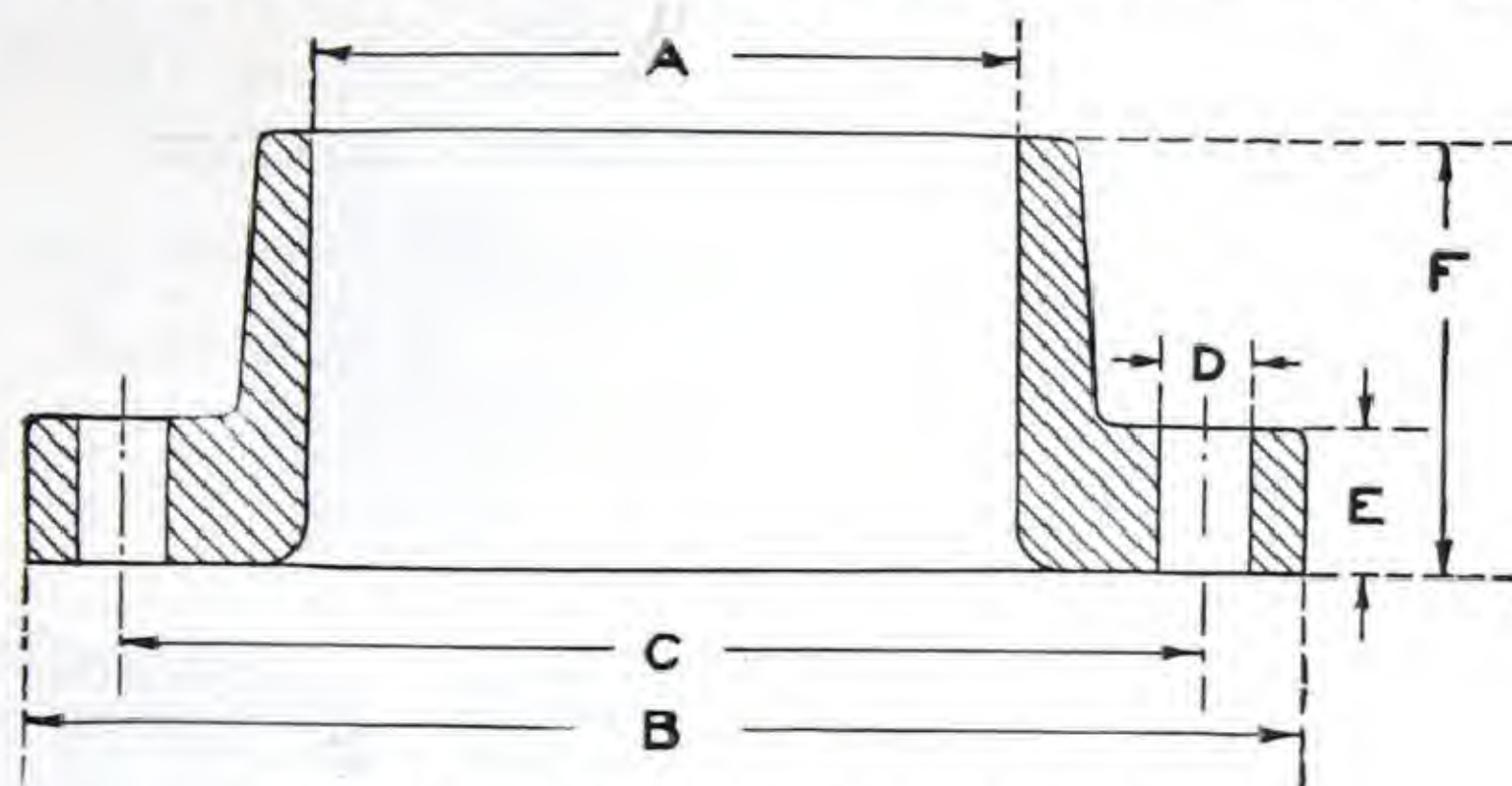
Prices for Cast Steel Lap Joint Flanges on application.

†Standard practice of manufacturers urges the discontinuance of these sizes which are considered as special.

Length of bolts given above provide for allowable variations in thickness of flanges and laps on pipe.

DIMENSIONS

Extra Heavy Forged Steel Lap Joint Flanges

Extra Heavy Forged Steel Lap Joint Flange
High Hub

DIMENSIONS

Pipe Size	A	B	C	D	E	F	No. of Bolts	Size of Bolts	Length of Bolts
2	$2\frac{7}{16}$	$6\frac{1}{2}$	5	$\frac{3}{4}$	$\frac{7}{8}$	$2\frac{13}{16}$	4	$\frac{5}{8}$	3
2½	$2\frac{15}{16}$	$7\frac{1}{2}$	$5\frac{7}{8}$	$\frac{7}{8}$	1	3	4	$\frac{3}{4}$	$3\frac{1}{4}$
3	$3\frac{9}{16}$	$8\frac{1}{4}$	$6\frac{5}{8}$	$\frac{7}{8}$	1	3	8	$\frac{3}{4}$	$3\frac{1}{4}$
3½	$4\frac{1}{16}$	9	$7\frac{1}{4}$	$\frac{7}{8}$	$1\frac{1}{8}$	$3\frac{1}{8}$	8	$\frac{3}{4}$	$3\frac{3}{4}$
4	$4\frac{5}{8}$	10	$7\frac{7}{8}$	$\frac{7}{8}$	$1\frac{1}{8}$	$3\frac{1}{8}$	8	$\frac{3}{4}$	$3\frac{3}{4}$
†4½	$5\frac{1}{8}$	$10\frac{1}{2}$	$8\frac{1}{2}$	$\frac{7}{8}$	$1\frac{1}{4}$	$3\frac{1}{4}$	8	$\frac{3}{4}$	4
5	$5\frac{11}{16}$	11	$9\frac{1}{4}$	$\frac{7}{8}$	$1\frac{1}{4}$	$3\frac{1}{4}$	8	$\frac{3}{4}$	4
6	$6\frac{3}{4}$	$12\frac{1}{2}$	$10\frac{5}{8}$	$\frac{7}{8}$	$1\frac{1}{4}$	$3\frac{1}{4}$	12	$\frac{3}{4}$	4
†7	$7\frac{3}{4}$	14	$11\frac{7}{8}$	1	$1\frac{5}{16}$	$3\frac{3}{8}$	12	$\frac{7}{8}$	$4\frac{1}{4}$
8	$8\frac{3}{4}$	15	13	1	$1\frac{3}{8}$	$3\frac{1}{2}$	12	$\frac{7}{8}$	$4\frac{1}{2}$
†9	$9\frac{13}{16}$	$16\frac{1}{4}$	14	$1\frac{1}{8}$	$1\frac{7}{16}$	$3\frac{5}{8}$	12	1	$4\frac{3}{4}$
10	$10\frac{15}{16}$	$17\frac{1}{2}$	$15\frac{1}{4}$	$1\frac{1}{8}$	$1\frac{1}{2}$	$3\frac{3}{4}$	16	1	5
12	$12\frac{15}{16}$	$20\frac{1}{2}$	$17\frac{3}{4}$	$1\frac{1}{4}$	$1\frac{5}{8}$	4	16	$1\frac{1}{8}$	$5\frac{1}{4}$
14	$14\frac{3}{16}$	23	$20\frac{1}{4}$	$1\frac{1}{4}$	$1\frac{3}{4}$	$4\frac{3}{8}$	20	$1\frac{1}{8}$	$5\frac{1}{2}$
†15	$15\frac{3}{16}$	$24\frac{1}{2}$	$21\frac{1}{2}$	$1\frac{3}{8}$	$1\frac{13}{16}$	$4\frac{1}{2}$	20	$1\frac{1}{4}$	6
16	$16\frac{3}{16}$	$25\frac{1}{2}$	$22\frac{1}{2}$	$1\frac{3}{8}$	$1\frac{7}{8}$	$4\frac{3}{4}$	20	$1\frac{1}{4}$	$6\frac{1}{4}$
18	$18\frac{3}{16}$	28	$24\frac{3}{4}$	$1\frac{3}{8}$	2	5	24	$1\frac{1}{4}$	$6\frac{3}{4}$
20	$20\frac{3}{16}$	$30\frac{1}{2}$	27	$1\frac{1}{2}$	$2\frac{1}{8}$	$5\frac{3}{8}$	24	$1\frac{3}{8}$	7
†22	$22\frac{3}{16}$	33	$29\frac{1}{4}$	$1\frac{5}{8}$	$2\frac{1}{4}$	$5\frac{5}{8}$	24	$1\frac{1}{2}$	$7\frac{1}{2}$
24	$24\frac{3}{16}$	36	32	$1\frac{3}{4}$	$2\frac{3}{8}$	$5\frac{7}{8}$	24	$1\frac{5}{8}$	$7\frac{3}{4}$

Sizes 14 to 24-inch are outside diameter of pipe.

Prices for Forged Steel Lap Joint Flanges on application.

Extra Heavy Forged Steel Lap Joint Flanges can also be furnished with Low Hub. Prices and dimensions on application.

†Standard practice of manufacturers urges the discontinuance of these sizes.

Length of Bolts given above provide for allowable variations in thicknesses of flanges and Laps on pipe.

FLANGES

*Methods of Facing**Extra Heavy Companion Flanges*

Cast Iron
Cast Steel

High-Test Gray-Iron (Semi-Steel)
Forged Steel



Raised Face



Male Face



Female Face

Spot Faced Bolt
Holes

Tongued Face



Grooved Face



Calking Recess

Showing Companion
Flanges Bolted
TogetherShowing Wooden
Flange Protector
Bolted on

Unless otherwise specified, Extra Heavy Companion Flanges will always be furnished with 1/16-inch raised face, without extra charge.

Gaskets are furnished only when specified and at an extra price. See list prices for gaskets, pages 349 and 350.

BOLTS AND NUTS

Machine Bolts

With Square Heads and Square Nuts, Finished Points



Square Head Bolt and Square Nut
 Manufacturer's Standard List
 Revised September 1, 1923

LIST PRICES—PER HUNDRED

Length Inches	DIAMETER, INCHES										
	1/4	5/16	3/8	7/16	1/2	5/8 to 3/4	3/4	7/8	1	1 1/8	1 1/4
1 1/2	1.70	2.00	2.40	3.00	3.70	5.50	7.70	10.50	15.10	22.50	30.00
2	1.80	2.15	2.60	3.25	4.00	5.90	8.25	11.20	16.00	23.70	31.50
2 1/2	1.90	2.30	2.80	3.50	4.30	6.30	8.80	11.90	16.90	24.90	33.00
3	2.00	2.45	3.00	3.75	4.60	6.70	9.35	12.60	17.50	26.10	34.50
3 1/2	2.10	2.60	3.20	4.00	4.90	7.10	9.90	13.30	18.70	27.30	36.00
4	2.20	2.75	3.40	4.25	5.20	7.50	10.45	14.00	19.60	28.50	37.50
4 1/2	2.30	2.90	3.60	4.50	5.50	7.90	11.00	14.70	20.50	29.70	39.00
5	2.40	3.05	3.80	4.75	5.80	8.30	11.55	15.40	21.40	30.90	40.50
5 1/2	2.50	3.20	4.00	5.00	6.10	8.70	12.10	16.10	22.30	32.10	42.00
6	2.60	3.35	4.20	5.25	6.40	9.10	12.65	16.80	23.20	33.30	43.50
6 1/2	3.70	4.50	5.40	6.50	7.70	9.50	13.20	17.50	24.10	34.50	45.00
7	3.80	4.65	5.60	6.75	8.00	9.90	13.75	18.20	25.00	35.70	46.50
7 1/2	3.90	4.80	5.80	7.00	8.30	10.30	14.30	18.90	25.90	36.90	48.00
8	4.00	4.95	6.00	7.25	8.60	10.70	14.85	19.60	26.80	38.10	49.50
9	4.20	5.25	6.40	7.75	9.20	11.50	15.95	21.00	28.60	40.50	52.50
10	4.40	5.55	6.80	8.25	9.80	12.30	17.05	22.40	30.40	42.90	55.50
11	4.60	5.85	7.20	8.75	10.40	13.10	18.15	23.80	32.20	45.30	58.50
12	4.80	6.15	7.60	9.25	11.00	13.90	19.25	25.20	34.00	47.70	61.50
13	.....	.....	8.00	9.75	11.60	14.70	20.35	26.60	35.80	50.10	64.50
14	.....	.....	8.40	10.25	12.20	15.50	21.45	28.00	37.60	52.50	67.50
15	.....	.....	8.80	10.75	12.80	16.30	22.55	29.40	39.40	54.90	70.50
16	.....	.....	9.20	11.25	13.40	17.10	23.65	30.80	41.20	57.30	73.50
17	.....	.....	.....	.....	14.00	17.90	24.75	32.20	43.00	59.70	76.50
18	.....	.....	.....	.....	14.60	18.70	25.85	33.60	44.80	62.10	79.50
19	.....	.....	.....	.....	15.20	19.50	26.95	35.00	46.60	64.50	82.50
20	.....	.....	.....	.....	15.80	20.30	28.05	36.40	48.40	66.90	85.50
21	.....	.....	.....	.....	.....	.....	29.15	37.80	50.20	69.30	88.50
22	.....	.....	.....	.....	.....	.....	30.25	39.20	52.00	71.70	91.50
23	.....	.....	.....	.....	.....	.....	31.35	40.60	53.80	74.10	94.50
24	.....	.....	.....	.....	.....	.....	32.45	42.00	55.60	76.50	97.50
25	.....	.....	.....	.....	.....	.....	33.55	43.40	57.40	78.90	100.50
26	.....	.....	.....	.....	.....	.....	34.65	44.80	59.20	81.30	103.50
27	.....	.....	.....	.....	.....	.....	35.75	46.20	61.00	83.70	106.50
28	.....	.....	.....	.....	.....	.....	36.85	47.60	62.80	86.10	109.50
29	.....	.....	.....	.....	.....	.....	37.95	49.00	64.60	88.50	112.50
30	.....	.....	.....	.....	.....	.....	39.05	50.40	66.40	90.90	115.50

The above Price List is the Manufacturer's Standard.

In the Pipe and Fitting Industry, however, Square Head Bolts with Hexagon Nuts is standard practice, therefore, add 10 per cent to the above list for Hexagon Nuts.

For Bolts with special heads or nuts, prices on application.

BOLTS AND NUTS

Stud Bolts

Rough, with Cold Punched, Chamfered and Trimmed Hexagon Nuts



Stud Bolt with Hexagon Nut

LIST PRICES—PER HUNDRED

LENGTH, INCHES	DIAMETER, INCHES				
	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{9}{16}$	$\frac{5}{8}$
$1\frac{1}{2}$	4.00	5.10	5.50	.....	.....
$1\frac{3}{4}$	4.10	5.25	5.65	.....	.....
2.....	4.20	5.40	5.80	8.50	8.50
$2\frac{1}{4}$	4.30	5.55	5.95	8.75	8.75
$2\frac{1}{2}$	4.40	5.70	6.10	9.00	9.00
$2\frac{3}{4}$	4.50	5.85	6.25	9.25	9.25
3.....	4.60	6.00	6.40	9.50	9.50
$3\frac{1}{4}$	4.70	6.15	6.55	9.75	9.75
$3\frac{1}{2}$	4.80	6.30	6.70	10.00	10.00
$3\frac{3}{4}$	4.90	6.45	6.85	10.25	10.25
4.....	5.00	6.60	7.00	10.50	10.50
$4\frac{1}{2}$	5.25	6.90	7.30	11.00	11.00
5.....	6.00	7.60	7.60	11.50	11.50
$5\frac{1}{2}$	7.25	8.00	8.00	12.00	12.00
6.....	8.00	8.45	8.45	12.50	12.50
Threads to Inch.....	16	14	13	12	11

LENGTH, INCHES	DIAMETER, INCHES				
	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{8}$	$1\frac{1}{4}$
2.....	12.40	.....	.....	.....	.....
$2\frac{1}{4}$	12.70	.....	.....	.....	.....
$2\frac{1}{2}$	13.00	18.00	.....	.....	.....
$2\frac{3}{4}$	13.30	18.50	.....	.....	.....
3.....	13.60	19.00	27.80	.....	.....
$3\frac{1}{4}$	13.90	19.50	28.40	.....	.....
$3\frac{1}{2}$	14.20	20.00	29.00	43.50	.....
$3\frac{3}{4}$	14.50	20.50	29.60	44.25	.....
4.....	14.80	21.00	30.20	45.00	64.00
$4\frac{1}{2}$	15.40	22.00	31.40	46.50	66.50
5.....	16.00	23.00	32.60	48.00	69.00
$5\frac{1}{2}$	16.60	24.00	33.80	49.50	71.50
6.....	17.20	25.00	35.00	51.00	74.00
Threads to inch.....	10	9	8	7	7

In ordering, state whole length, also the length of thread required on each end.
For Stud Bolts without Nuts, deduct 15 per cent from above lists.

BOLTS

*Strength of U. S. Standard Bolts**Sizes 1/4 to 2 1/2-inches in Diameter*

BOLT		AREAS		TENSILE STRESS			SHEARING STRESS			
Diameter of Bolts Inches	Number of Threads Per Inch	Full Bolt Square Inches	Bottom of Threads Square Inches	10,000 Lbs. Per Sq. Inch Pounds	12,500 Lbs. Per Sq. Inch Pounds	17,500 Lbs. Per Sq. Inch Pounds	Full Bolt		Bottom of Thread	
							At 7500 Lbs. Per Sq. Inch Pounds	At 10,000 Lbs. Per Sq. Inch Pounds	At 7500 Lbs. Per Sq. Inch Pounds	At 10,000 Lbs. Per Sq. Inch Pounds
1/4	20	.049	.027	270	340	470	380	490	200	270
5/16	18	.077	.045	450	570	790	580	770	340	450
3/8	16	.110	.068	680	850	1190	830	1100	510	680
7/16	14	.150	.093	930	1170	1630	1130	1500	700	930
1/2	12	.196	.120	1200	1500	2100	1470	1960	900	1200
9/16	12	.248	.162	1620	2030	2840	1860	2480	1220	1620
5/8	11	.307	.202	2020	2520	3530	2300	3070	1510	2020
3/4	10	.442	.302	3020	3770	5290	3310	4420	2270	3020
7/8	9	.601	.419	4190	5240	7340	4510	6010	3150	4190
1	8	.785	.551	5510	6890	9640	5890	7850	4130	5510
1 1/8	7	.994	.693	6930	8660	12130	7450	9940	5200	6930
1 1/4	7	1.227	.890	8890	11120	15570	9200	12270	6670	8900
1 3/8	6	1.485	1.054	10540	13180	18450	11140	14850	7910	10540
1 1/2	6	1.767	1.294	12940	16170	22640	13250	17670	9700	12940
1 5/8	5 1/2	2.074	1.515	15150	18940	26510	15550	20740	11360	15150
1 3/4	5	2.405	1.745	17450	21800	30520	18040	24050	13080	17440
1 7/8	5	2.761	2.049	20490	25610	35860	20710	27610	15370	20490
2	4 1/2	3.142	2.300	23000	28750	40250	23560	31420	17250	23000
2 1/4	4 1/2	3.967	3.021	30210	37770	52870	29820	39760	22660	30210
2 1/2	4	4.909	3.716	37160	46450	65040	36820	49090	27870	37160

NUTS

Cold Punched Square and Hexagon Nuts
Chamfered and Trimmed with Reamed Holes
U. S. Standard Sizes

Manufacturers' Standard List

September 1, 1923



Square Nut



Hexagon Nut

LIST PRICES

Wide	Thick	Hole	Bolt	Hexagon Tapped Price per Pound	Square Tapped Price per Pound	Approximate Number of Hexagon Tapped in 100 Pounds	Approximate Number of Square Tapped in 100 Pounds
$\frac{1}{2}$	$\frac{1}{4}$	$\frac{13}{64}$	$\frac{1}{4}$	\$0.295	\$0.220	8700	7500
$\frac{19}{32}$	$\frac{5}{16}$	$\frac{1}{4}$	$\frac{5}{16}$	.260	.195	4800	4200
$\frac{11}{16}$	$\frac{3}{8}$	$\frac{19}{64}$	$\frac{3}{8}$	.201	.156	3175	2600
$\frac{25}{32}$	$\frac{7}{16}$	$\frac{11}{32}$	$\frac{7}{16}$	.193	.149	2100	1940
$\frac{7}{8}$	$\frac{1}{2}$	$\frac{25}{64}$	$\frac{1}{2}$	.153	.123	1500	1260
$\frac{31}{32}$	$\frac{9}{16}$	$\frac{29}{64}$	$\frac{9}{16}$	.153	.123	1100	950
$1\frac{1}{16}$	$\frac{5}{8}$	$\frac{33}{64}$	$\frac{5}{8}$	.135	.107	800	665
$1\frac{1}{4}$	$\frac{3}{4}$	$\frac{5}{8}$	$\frac{3}{4}$	.123	.103	494	404
$1\frac{7}{16}$	$\frac{7}{8}$	$\frac{47}{64}$	$\frac{7}{8}$	.120	.102	320	266
$1\frac{5}{8}$	1	$\frac{27}{32}$	1	.120	.102	223	184
$1\frac{13}{16}$	$1\frac{1}{8}$	$\frac{15}{16}$	$1\frac{1}{8}$	.120	.102	162	138
2	$1\frac{1}{4}$	$1\frac{1}{16}$	$1\frac{1}{4}$	.124	.107	119	103
$2\frac{3}{16}$	$1\frac{3}{8}$	$1\frac{5}{32}$	$1\frac{3}{8}$	.129	.109	92	74
$2\frac{3}{8}$	$1\frac{1}{2}$	$1\frac{9}{32}$	$1\frac{1}{2}$	.134	.113	72	63
$2\frac{9}{16}$	$1\frac{5}{8}$	$1\frac{13}{32}$	$1\frac{5}{8}$	.141	.118	58	49
$2\frac{3}{4}$	$1\frac{3}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	.149	.122	45	38
$2\frac{15}{16}$	$1\frac{7}{8}$	$1\frac{5}{8}$	$1\frac{7}{8}$	.155	.128	38	31
$3\frac{1}{8}$	2	$1\frac{23}{32}$	2	.156	.129	31	26
$3\frac{1}{2}$	$2\frac{1}{4}$	$1\frac{61}{64}$	$2\frac{1}{4}$	.163	.136	23	19
$3\frac{7}{8}$	$2\frac{1}{2}$	$2\frac{3}{16}$	$2\frac{1}{2}$	.175	.148	16	13
$4\frac{1}{4}$	$2\frac{3}{4}$	$2\frac{7}{16}$	$2\frac{3}{4}$	.181	.154	12	10
$4\frac{5}{8}$	3	$2\frac{11}{16}$	3	.187	.160	10	8
5	$3\frac{1}{4}$	$2\frac{15}{16}$	$3\frac{1}{4}$	.188	.161	8	$6\frac{1}{4}$
$5\frac{3}{8}$	$3\frac{1}{2}$	$3\frac{5}{32}$	$3\frac{1}{2}$	.189	.162	$6\frac{1}{2}$	$5\frac{1}{4}$

Nuts tapped different from standard will be furnished at an extra price.
 Nuts for $2\frac{1}{4}$ -inch bolts and larger are forged.

Extra for less than 200 pounds of a size, 20 cents per 100 pounds.

Extra for less than 100 pounds of a size, 50 cents per 100 pounds.

NUTS

Hot Pressed Square and Hexagon Nuts

U. S. Standard Sizes

Manufacturers' Standard List

September 1, 1923



Square Nut



Hexagon Nut

LIST PRICES

Wide	Thick	Hole Approximate	Bolt	Hexagon Tapped Price per Pound	Square Tapped Price per Pound
$\frac{1}{2}$	$\frac{1}{4}$	$\frac{3}{16}$	$\frac{1}{4}$	\$0.225	\$0.15
$\frac{19}{32}$	$\frac{5}{16}$	$\frac{1}{4}$	$\frac{5}{16}$	.20	.135
$\frac{11}{16}$	$\frac{3}{8}$	$\frac{19}{64}$	$\frac{3}{8}$	.156	.116
$\frac{25}{32}$	$\frac{7}{16}$	$\frac{11}{32}$	$\frac{7}{16}$	.143	.109
$\frac{7}{8}$	$\frac{1}{2}$	$\frac{13}{32}$	$\frac{1}{2}$	.135	.107
$\frac{31}{32}$	$\frac{9}{16}$	$\frac{29}{64}$	$\frac{9}{16}$	.135	.107
$1\frac{1}{16}$	$\frac{5}{8}$	$\frac{33}{64}$	$\frac{5}{8}$	.124	.10
$1\frac{1}{4}$	$\frac{3}{4}$	$\frac{5}{8}$	$\frac{3}{4}$	.11	.092
$1\frac{7}{16}$	$\frac{7}{8}$	$\frac{47}{64}$	$\frac{7}{8}$	.108	.09
$1\frac{5}{8}$	1	$\frac{27}{32}$	1	.108	.09
$1\frac{13}{16}$	$1\frac{1}{8}$	$\frac{15}{16}$	$1\frac{1}{8}$	.108	.09
2	$1\frac{1}{4}$	$1\frac{1}{16}$	$1\frac{1}{4}$	.108	.09
$2\frac{3}{16}$	$1\frac{3}{8}$	$1\frac{5}{32}$	$1\frac{3}{8}$	.11	.091
$2\frac{3}{8}$	$1\frac{1}{2}$	$1\frac{9}{32}$	$1\frac{1}{2}$	.112	.094
$2\frac{9}{16}$	$1\frac{5}{8}$	$1\frac{25}{64}$	$1\frac{5}{8}$	.114	.097
$2\frac{3}{4}$	$1\frac{3}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	.117	.10
$2\frac{15}{16}$	$1\frac{7}{8}$	$1\frac{5}{8}$	$1\frac{7}{8}$	.12	.103
$3\frac{1}{8}$	2	$1\frac{23}{32}$	2	.123	.106
$3\frac{5}{16}$	$2\frac{1}{8}$	$1\frac{13}{16}$	$2\frac{1}{8}$	.129	.11
$3\frac{1}{2}$	$2\frac{1}{4}$	$1\frac{15}{16}$	$2\frac{1}{4}$	.13	.111
$3\frac{11}{16}$	$2\frac{3}{8}$	$2\frac{1}{16}$	$2\frac{3}{8}$	.136	.115
$3\frac{7}{8}$	$2\frac{1}{2}$	$2\frac{3}{16}$	$2\frac{1}{2}$	.139	.118
$4\frac{1}{4}$	$2\frac{3}{4}$	$2\frac{7}{16}$	$2\frac{3}{4}$	.146	.124
$4\frac{5}{8}$	3	$2\frac{5}{8}$	3	.152	.13

Nuts tapped different from Standard will be furnished at an extra price.
 Extra for less than 200 pounds of a size, 20 cents per 100 pounds.
 Extra for less than 100 pounds of a size, 50 cents per 100 pounds.

GASKETS

*For Standard and Low Pressure Flanged Valves
and Fittings*



Ring Gasket



Full Face Gasket

LIST PRICES

RING GASKETS					FULL FACE GASKETS			
Size of Valve or Fitting Inches	$\frac{1}{16}$ -inch Cloth Insertion Gaskets Fig. No. 1051 Each	$\frac{1}{16}$ -inch Red Rubber Gaskets Fig. No. 1052 Each	Corru- gated Copper Gaskets Fig. No. 1053 Each	$\frac{1}{16}$ -inch Sheet Asbestos Gaskets Fig. No. 1054 Each	$\frac{1}{16}$ -inch Cloth Insertion Gaskets Fig. No. 1055 Each	$\frac{1}{16}$ -inch Red Rubber Gaskets Fig. No. 1056 Each	Corru- gated Copper Gaskets Fig. No. 1057 Each	$\frac{1}{16}$ -inch Sheet Asbestos Gaskets Fig. No. 1058 Each
1	.05	.05	.16	.10	.10	.14	.25	.21
1 $\frac{1}{4}$	.07	.06	.17	.14	.14	.17	.30	.28
1 $\frac{1}{2}$	.07	.08	.18	.17	.14	.21	.35	.35
2	.07	.10	.21	.20	.18	.30	.50	.42
2 $\frac{1}{2}$	.09	.16	.27	.25	.23	.39	.67	.52
3	.12	.17	.31	.35	.28	.43	.75	.65
3 $\frac{1}{2}$	.14	.26	.47	.45	.30	.55	.95	.85
4	.16	.29	.52	.50	.35	.60	1.05	1.05
†4 $\frac{1}{2}$	.16	.32	.52	.55	.37	.69	1.05	1.10
5	.19	.32	.55	.60	.42	.69	1.20	1.20
6	.23	.37	.65	.70	.47	.78	1.35	1.40
†7	.28	.52	.80	.85	.58	1.00	1.70	1.75
8	.30	.52	.90	.95	.65	1.00	1.85	1.90
10	.42	.72	1.30	1.40	.88	1.43	2.45	2.75
12	.58	1.06	1.90	1.75	1.15	2.00	3.40	3.45
14	.70	1.06	1.90	2.15	1.30	2.25	3.85	3.85
†15	.75	1.30	2.15	2.55	1.50	2.72	4.25	4.75
16	.82	1.42	2.40	3.00	1.65	2.72	4.65	5.60
18	.86	1.42	2.40	3.25	1.85	2.77	4.75	6.00
20	1.02	1.56	2.75	3.60	2.00	3.28	5.60	6.50
†22	1.10	1.65	3.05	4.30	2.10	4.15	6.10	7.75
24	1.40	1.76	3.50	4.80	2.55	4.15	7.05	8.55

Ring Gaskets will always be furnished unless otherwise specified.

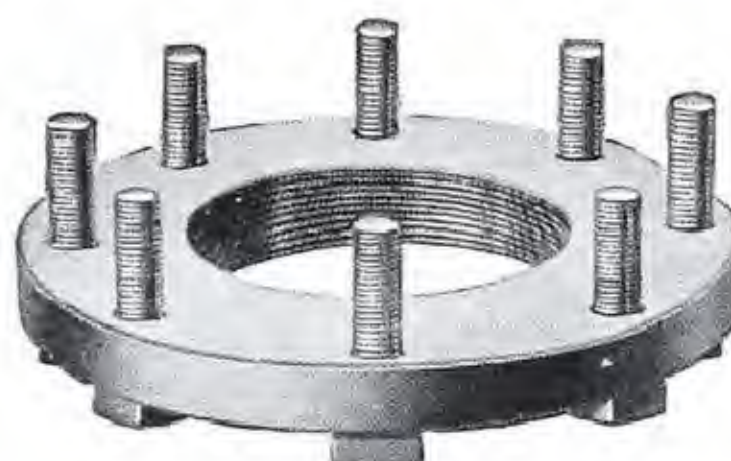
The commercial corrugated copper gasket is made from 27 gauge sheet copper, and this gauge will be furnished on all orders. Full face gaskets are furnished without bolt holes. Bolt holes will be punched when so specified at an extra price.

†Standard practice of manufacturers urges the discontinuance of these sizes.
Order by Figure Number.

GASKETS

For Extra Heavy Flanged Valves and Fittings

Ring Gasket



Full Face Gasket

LIST PRICES AND DIMENSIONS

RING GASKETS				FULL FACE GASKETS		
Size of Valve or Fitting Inches	Corrugated Copper Gaskets Fig. No. 1059 Each	1/16-Inch Asbestos Sheet Gaskets Fig. No. 1060 Each	Inside and Outside Diameter Inches	Corrugated Copper Gaskets Fig. No. 1061 Each	1/16-Inch Asbestos Sheet Gaskets Fig. No. 1062 Each	Inside and Outside Diameter Inches
1	.17	.14	1 x 2 3/4	.30	.32	1 x 4 1/2
1 1/4	.18	.17	1 1/4 x 3 1/4	.36	.38	1 1/4 x 5
1 1/2	.21	.21	1 1/2 x 3 7/8	.54	.47	1 1/2 x 6
2	.24	.26	2 x 4 3/8	.60	.60	2 x 6 1/2
2 1/2	.31	.33	2 1/2 x 5 1/8	.80	.65	2 1/2 x 7 1/2
3	.43	.41	3 x 5 7/8	.95	.87	3 x 8 1/4
3 1/2	.47	.46	3 1/2 x 6 1/2	1.10	1.05	3 1/2 x 9
4	.58	.57	4 x 7 1/8	1.30	1.30	4 x 10
†4 1/2	.62	.61	4 1/2 x 7 3/4	1.40	1.40	4 1/2 x 10 1/2
5	.75	.77	5 x 8 1/2	1.50	1.55	5 x 11
6	1.00	.95	6 x 9 7/8	1.90	1.90	6 x 12 1/2
†7	1.15	1.20	7 x 11	2.30	2.30	7 x 14
8	1.35	1.25	8 x 12 1/8	2.55	2.50	8 x 15
10	1.65	1.75	10 x 14 1/4	3.25	3.30	10 x 17 1/2
12	2.15	2.15	12 x 16 5/8	4.35	4.30	12 x 20 1/2
14	2.75	2.85	14 x 19 1/8	5.15	4.75	14 x 23
†15	2.90	3.10	15 x 20 1/4	5.90	5.75	15 x 24 1/2
16	3.25	3.65	16 x 21 1/4	6.20	6.00	16 x 25 1/2
18	3.60	4.15	18 x 23 1/2	7.25	6.85	18 x 28
20	3.95	4.75	20 x 25 5/8	8.35	7.30	20 x 30 1/2
†22	4.50	5.20	22 x 27 3/4	9.50	9.45	22 x 33
24	5.25	6.00	24 x 30 3/8	11.30	10.50	24 x 36

Corrugated Copper Gaskets are made from 27 gauge copper. We can furnish copper gaskets of heavier gauge at a special price.

We can furnish Steel Gaskets or other kinds of gaskets cut from commercial sheet at special prices.

Full face gaskets are furnished without bolt holes; bolt holes will be punched at an extra price when so ordered.

†Standard practice of manufacturers urges the discontinuance of these sizes.

Order by Figure Number.

GASKETS

*For Extra Heavy Flanged Valves
and Fittings*

LIST PRICES AND DIMENSIONS

RING GASKETS FOR MALE AND FEMALE JOINTS				RING GASKETS FOR TONGUE AND GROOVE JOINTS		
Size of Valve or Fitting	Corrugated Copper Gaskets Fig. No. 1063	$\frac{1}{16}$ -inch Asbestos Sheet Gaskets Fig. No. 1064	Inside and Outside Diameter	Corrugated Copper Gaskets Fig. No. 1065	$\frac{1}{16}$ -inch Asbestos Sheet Gaskets Fig. No. 1066	Inside and Outside Diameter
Inches	Each	Each	Inches	Each	Each	Inches
1	.16	.09	1 x 2 $\frac{5}{8}$	.17	.06	1 $\frac{3}{4}$ x 2 $\frac{1}{2}$
1 $\frac{1}{4}$	.17	.10	1 $\frac{1}{4}$ x 2 $\frac{3}{4}$	.18	.06	2 $\frac{1}{8}$ x 3
1 $\frac{1}{2}$	.18	.12	1 $\frac{1}{2}$ x 3 $\frac{1}{8}$	.19	.07	2 $\frac{3}{4}$ x 3 $\frac{5}{8}$
2	.19	.14	2 x 3 $\frac{5}{8}$	.21	.09	3 $\frac{1}{8}$ x 4 $\frac{1}{8}$
2 $\frac{1}{2}$	.21	.17	2 $\frac{1}{2}$ x 4 $\frac{1}{8}$	.29	.12	3 $\frac{5}{8}$ x 4 $\frac{5}{8}$
3	.29	.22	3 x 5	.29	.14	4 $\frac{1}{4}$ x 5 $\frac{1}{4}$
3 $\frac{1}{2}$	.32	.29	3 $\frac{1}{2}$ x 5 $\frac{1}{2}$	.35	.16	4 $\frac{3}{4}$ x 5 $\frac{3}{4}$
4	.38	.34	4 x 6	.42	.17	5 $\frac{1}{4}$ x 6 $\frac{1}{4}$
†4 $\frac{1}{2}$	.47	.36	4 $\frac{1}{2}$ x 6 $\frac{1}{2}$	.45	.17	5 $\frac{3}{4}$ x 6 $\frac{3}{4}$
5	.55	.46	5 x 7 $\frac{1}{4}$	.55	.21	6 $\frac{1}{4}$ x 7 $\frac{1}{4}$
6	.65	.52	6 x 8 $\frac{3}{8}$	.65	.23	7 $\frac{1}{2}$ x 8 $\frac{1}{2}$
†7	.80	.60	7 x 9 $\frac{3}{8}$	.80	.25	8 $\frac{5}{8}$ x 9 $\frac{5}{8}$
8	.90	.77	8 x 10 $\frac{5}{8}$	.90	.30	9 $\frac{5}{8}$ x 10 $\frac{7}{8}$
10	1.20	1.05	10 x 12 $\frac{3}{4}$	1.20	.43	11 $\frac{5}{8}$ x 13 $\frac{1}{8}$
12	1.75	1.30	12 x 15 $\frac{1}{4}$	1.75	.52	13 $\frac{5}{8}$ x 15 $\frac{1}{8}$
14	1.90	1.40	14 x 16 $\frac{1}{2}$	1.90	.60	15 $\frac{7}{8}$ x 17 $\frac{3}{8}$
†15	2.00	1.55	15 x 17 $\frac{1}{2}$	2.15	.70	17 $\frac{1}{8}$ x 18 $\frac{5}{8}$
16	2.15	1.80	16 x 18 $\frac{1}{2}$	2.40	.85	18 $\frac{3}{8}$ x 20 $\frac{1}{8}$
18	2.35	2.05	18 x 21	2.75	1.20	20 $\frac{3}{8}$ x 22 $\frac{3}{8}$
20	2.75	2.60	20 x 23	2.90	1.40	22 $\frac{5}{16}$ x 24 $\frac{5}{16}$
†22	3.00	3.40	22 x 25 $\frac{1}{2}$	3.40	1.55	24 $\frac{1}{2}$ x 26 $\frac{1}{2}$
24	3.40	3.85	24 x 27 $\frac{1}{2}$	3.50	1.75	26 $\frac{1}{2}$ x 28 $\frac{1}{2}$

Corrugated Copper Gaskets are made from 27 gauge copper. We can furnish copper gaskets of heavier gauge at a special price.

We can furnish Steel Gaskets or other kinds of gaskets cut from commercial sheet at special prices.

†Standard practice of manufacturers urges the discontinuance of these sizes.

Order by Figure Number.

GASKETS

Rainbow Packing

Made in Rolls of about 200 lbs. each, $\frac{1}{32}$, $\frac{1}{16}$, $\frac{3}{32}$, $\frac{1}{8}$, $\frac{3}{16}$, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$ inch thick and one yard wide.

Jenkins Standard '96 Packing

Jenkins '96 Packing is made one yard wide and $\frac{1}{32}$, $\frac{1}{16}$, $\frac{3}{32}$, $\frac{1}{8}$, $\frac{3}{16}$, and $\frac{1}{4}$ inch thick. The $\frac{1}{32}$ in. weighs about $2\frac{3}{4}$ lbs. per square yard, $\frac{1}{16}$ in. $5\frac{1}{2}$ lbs., $\frac{3}{32}$ in. $8\frac{1}{4}$ lbs., $\frac{1}{8}$ in. 11 lbs., $\frac{3}{16}$ in. $16\frac{1}{2}$ lbs., $\frac{1}{4}$ in. $22\frac{1}{2}$ lbs.

Sheet Rubber Packing

Either Cloth Insertion, Cloth on One or Both Sides.



Cloth Insertion Rubber Packing is made in Rolls, $\frac{1}{32}$, $\frac{1}{16}$, $\frac{3}{32}$, $\frac{1}{8}$, $\frac{3}{16}$, $\frac{1}{4}$ inch thick and one yard wide.

Packing and Cut Gaskets for High Pressure and Super-Heated Steam Service

We are in a position to furnish the best quality packing or cut gaskets for High Pressure or Super-Heated Steam Service.

Prices on application.

STANDARD CAST IRON FLANGED PIPE

*Standard Thickness and Weights**Classes A, B, C and D*

Nominal Diameter Inches	CLASS A—100 FEET HEAD 43 POUNDS PRESSURE				CLASS B—200 FEET HEAD 86 POUNDS PRESSURE			
	Thickness Inches	Weight, pounds per			Thickness Inches	Weight, pounds per		
		Foot	Length	Single Flange		Foot	Length	Single Flange
3	.39	13.0	169	6.4	.42	14.6	188	6.2
4	.42	18.0	238	11.1	.45	20.1	263	10.7
6	.44	27.9	365	15.0	.48	31.1	402	14.4
8	.46	38.7	511	23.1	.51	42.7	559	23.1
10	.50	51.9	687	32.2	.57	58.8	770	32.2
12	.54	67.0	899	47.7	.62	76.4	1012	47.7
14	.57	82.3	1104	58.1	.66	94.7	1253	58.1
16	.60	98.8	1332	73.2	.70	114.6	1522	73.2
18	.64	118.3	1576	78.1	.75	137.8	1810	78.1
20	.67	137.4	1848	99.8	.80	163.1	2157	99.8
24	.76	186.5	2512	137.2	.89	217.3	2882	137.2
30	.88	266.1	3622	214.4	1.03	312.6	4166	207.2
36	.99	358.7	4959	327.4	1.15	418.7	5654	314.8
40	1.06	427.2	5940	406.6	1.23	497.0	6753	394.5
42	1.10	464.6	6492	458.5	1.28	542.2	7395	444.2
48	1.26	608.0	8408	555.9	1.42	687.2	9324	538.9
	CLASS C—300 FEET HEAD 130 POUNDS PRESSURE				CLASS D—400 FEET HEAD 173 POUNDS PRESSURE			
	Thickness Inches	Weight, pounds per			Thickness Inches	Weight, pounds per		
		Foot	Length	Single Flange		Foot	Length	Single Flange
3	.45	15.5	198	6.2	.48	16.4	209	6.2
4	.48	21.3	277	10.7	.52	22.8	295	10.7
6	.51	32.9	424	14.4	.55	35.3	452	14.4
8	.56	48.0	620	22.0	.60	51.2	658	22.0
10	.62	65.5	847	30.6	.68	71.4	918	30.6
12	.68	85.4	1116	45.6	.75	93.7	1216	45.6
14	.74	108.1	1407	55.1	.82	119.2	1541	55.1
16	.80	133.3	1738	69.1	.89	147.5	1908	69.1
18	.87	162.4	2094	72.8	.96	178.4	2286	72.8
20	.92	190.6	2473	92.9	1.03	212.3	2733	92.9
24	1.04	257.6	3345	126.8	1.16	286.0	3686	126.8
30	1.20	366.9	4795	196.0	1.37	421.2	5427	186.4
36	1.36	497.7	6572	299.9	1.58	581.9	7548	282.5
40	1.48	601.6	7965	372.7	1.72	703.4	9143	351.1
42	1.54	657.4	8720	415.4	1.78	764.1	9953	392.1
48	1.71	832.7	11001	504.4	1.96	960.8	12471	470.8

All weights are approximate only.

STANDARD CAST IRON FLANGED PIPE

*Flange Dimensions and Drilling**Classes A, B, C and D*

DIMENSION OF FLANGES

CLASSES A, B AND C ALSO CLASS D UP TO 150 POUNDS PRESSURE						CLASS D FOR PRESSURES 151 TO 173 POUNDS					
Nominal Diameter Inches	Diameter of Flanges—Inches	Diameter of Bolt Circle—Inches	Number of Bolts	Diameter of Bolts—Inches	Thickness of Flanges—Inches	Nominal Diameter Inches	Diameter of Flanges—Inches	Diameter of Bolt Circle—Inches	Number of Bolts	Diameter of Bolts—Inches	Thickness of Flanges—Inches
3	7½	6	4	5/8	¾	3	8¼	6⅝	8	¾	1⅛
4	9	7½	8	5/8	15/16	4	10	7⅞	8	¾	1¼
6	11	9½	8	¾	1	6	12½	10⅝	12	¾	1⅞
8	13½	11¾	8	¾	1⅛	8	15	13	12	7/8	1⅝
10	16	14¼	12	7/8	1⅜	10	17½	15¼	16	1	1⅞
12	19	17	12	7/8	1¼	12	20½	17¾	16	1⅛	2
14	21	18¾	12	1	1⅜	14	23	20¼	20	1⅛	2⅛
16	23½	21¼	16	1	1⅞	16	25½	22½	20	1¼	2¼
18	25	22¾	16	1⅛	1⅞	18	28	24¾	24	1¼	2⅜
20	27½	25	20	1⅛	1⅞	20	30½	27	24	1⅜	2½
24	32	29½	20	1¼	1⅞	24	36	32	24	1⅝	2¾
30	38¾	36	28	1⅜	2⅛	30	43	39¼	28	1¾	3
36	46	42¾	32	1½	2⅜	36	50	46	32	1⅞	3⅜
40	50¾	47¼	36	1⅝	2½	40	54½	50¼	36	1⅞	3⅞
42	53	49½	36	1⅝	2⅝	42	57	52¾	36	1⅞	3⅞
48	59½	56	44	1⅝	2¾	48	65	60¾	40	2	4

Cast Iron Flanged Pipe is made in 12'-0" Lengths and Faced ⅛-inch short for gasket.

Special short lengths are made to order.

Bolt holes drilled ⅛-inch larger than bolts.

If other than above drillings are required please send Template.

CAST IRON
BELL AND SPIGOT PIPE

American Water Works Association Standard

For Water and Gas Mains, Sewers, Culverts, Etc.

3 Inch to 12 Inch sizes of Class C Pipe carried in stock. Other sizes of Class C Pipe and all sizes of Classes A, B and D Pipe furnished on order, also high pressure Pipe, Classes E, F, G and H.

Prices on Application



Inquiries should state size, approximate quantity and "Class" of pipe (or pressure under which it is to be used) and, if possible, the intended service, time and place of delivery desired, etc. Designate the sizes of pipe by internal diameters: a 12 inch pipe is 12 inches inside diameter.

Weights given in the accompanying table are approximate weights. "Weights per Length" are for 12 foot laying lengths and include the bell. "Weights per Foot" include allowance for the bell, based on 12 foot laying lengths.

CAST IRON BELL AND SPIGOT PIPE

Standard Thickness and Weights

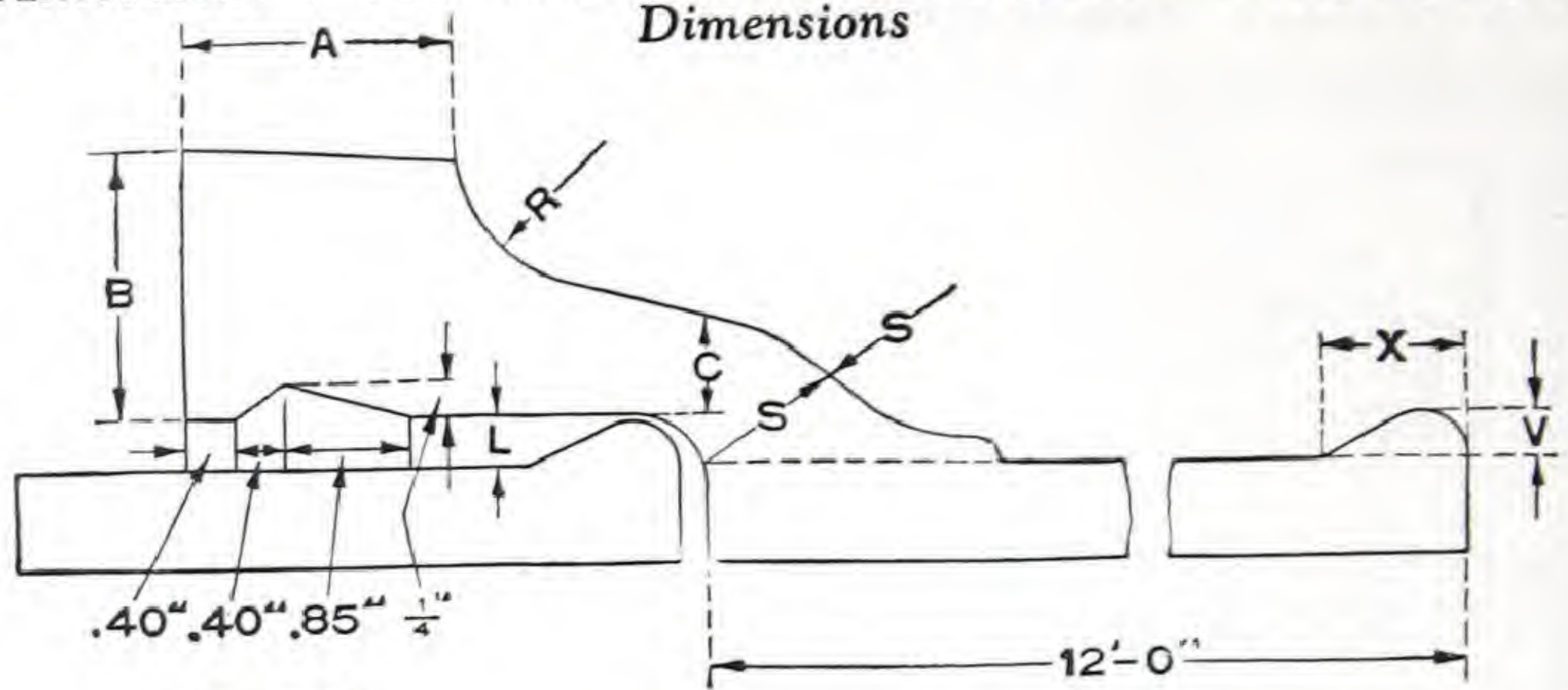
American Water Works Association, Classes A, B, C, D

Nominal Inside DiameterInches	CLASS A 100-Foot Head 43 Pounds Pressure			CLASS B 200-Foot Head 86 Pounds Pressure			Approx. Lbs. Lead per Joint 2 Inches Thick	Approx. Lbs. Hemp per Joint
	Thick- ness Inches	Weight Per		Thick- ness Inches	Weight Per			
		Foot	Length		Foot	Length		
4	.42	20.0	240	.45	21.7	260	7.50	.21
6	.44	30.8	370	.48	33.3	400	10.25	.31
8	.46	42.9	515	.51	47.5	570	13.25	.44
10	.50	57.1	685	.57	63.8	765	16.00	.53
12	.54	72.5	870	.62	82.1	985	19.00	.61
14	.57	89.6	1075	.66	102.5	1230	22.00	.81
16	.60	108.3	1300	.70	125.0	1500	30.00	.94
18	.64	129.2	1550	.75	150.0	1800	33.80	1.00
20	.67	150.0	1800	.80	175.0	2100	37.00	1.25
24	.76	204.2	2450	.89	233.3	2800	44.00	1.50
30	.88	291.7	3500	1.03	333.3	4000	54.25	2.06
36	.99	391.7	4700	1.15	454.2	5450	64.75	3.00
42	1.10	512.5	6150	1.28	591.7	7100	75.25	3.62
48	1.26	666.7	8000	1.42	750.0	9000	85.50	4.37

Nominal Inside DiameterInches	CLASS C 300-Foot Head 130 Pounds Pressure			CLASS D 400-Foot Head 173 Pounds Pressure			Approx. Lbs. Lead per Joint 2 Inches Thick	Approx. Lbs. Hemp per Joint
	Thick- ness Inches	Weight Per		Thick- ness Inches	Weight Per			
		Foot	Length		Foot	Length		
4	.48	23.3	280	.52	25.0	300	7.50	.21
6	.51	35.8	430	.55	38.3	460	10.25	.31
8	.56	52.1	625	.60	55.8	670	13.25	.44
10	.62	70.8	850	.68	76.7	920	16.00	.53
12	.68	91.7	1100	.75	100.0	1200	19.00	.61
14	.74	116.7	1400	.82	129.2	1550	22.00	.81
16	.80	143.8	1725	.89	158.3	1900	30.00	.94
18	.87	175.0	2100	.96	191.7	2300	33.80	1.00
20	.92	208.3	2500	1.03	229.2	2750	37.00	1.25
24	1.04	279.2	3350	1.16	306.7	3680	44.00	1.50
30	1.20	400.0	4800	1.37	450.0	5400	54.25	2.06
36	1.36	545.8	6550	1.58	625.0	7500	64.75	3.00
42	1.54	716.7	8600	1.78	825.0	9900	75.25	3.62
48	1.71	908.3	10900	1.96	1050.0	12600	85.50	4.37

CAST IRON BELL AND SPIGOT PIPE

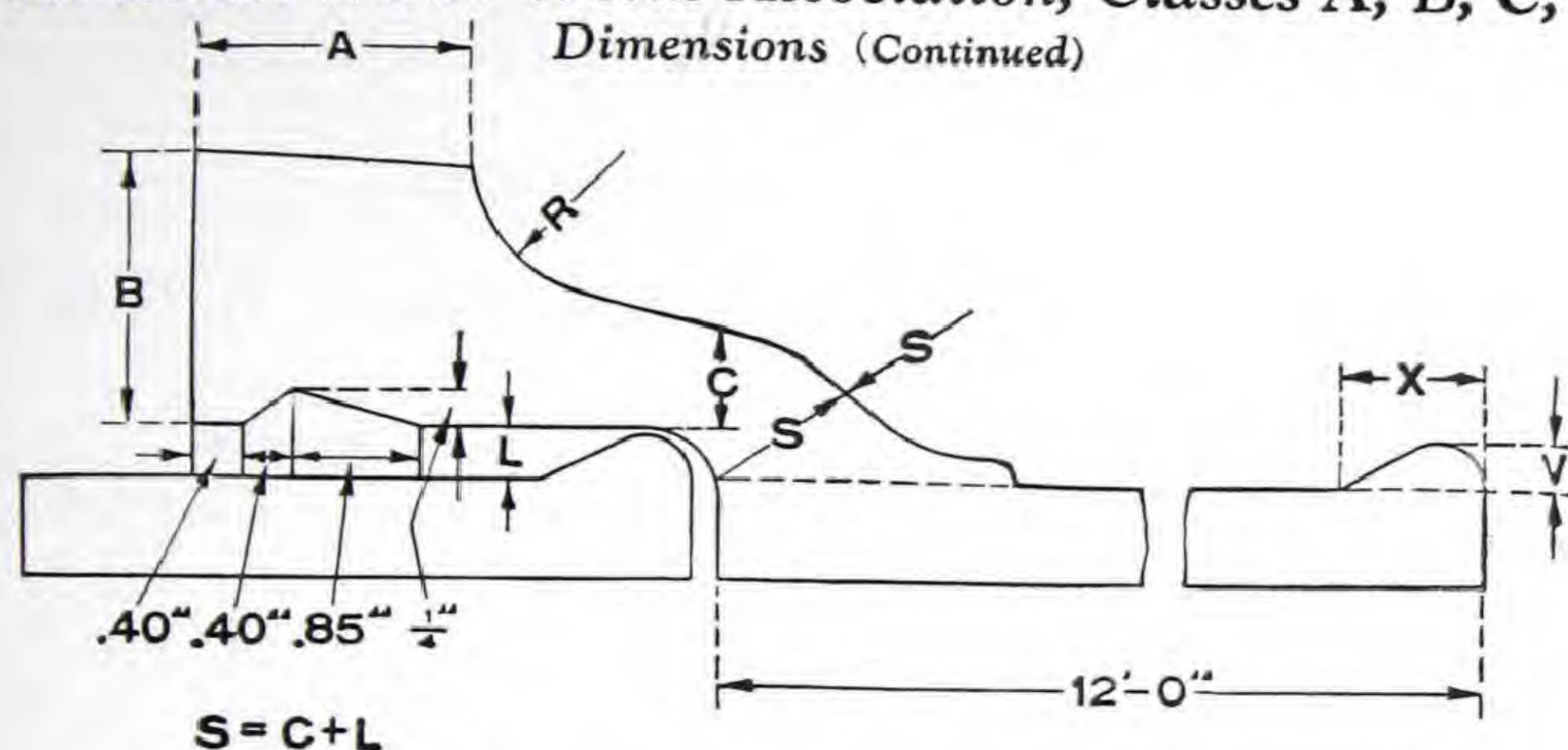
American Water Works Association, Classes A, B, C, D



Nom'l Diam. Inches	Classes	Actual Outside Diam. Inches	Diam. of Sockets		Depth of Sockets		A	B	C
			Pipe Inches	Special Castings Inches	Pipe Inches	Special Cast'gs Inches			
4	A	4.80	5.60	5.70	3.50	4.00	1.5	1.30	.65
4	B-C-D	5.00	5.80	5.70	3.50	4.00	1.5	1.30	.65
6	A	6.90	7.70	7.80	3.50	4.00	1.5	1.40	.70
6	B-C-D	7.10	7.90	7.80	3.50	4.00	1.5	1.40	.70
8	A-B	9.05	9.85	10.00	4.00	4.00	1.5	1.50	.75
8	C-D	9.30	10.10	10.00	4.00	4.00	1.5	1.50	.75
10	A-B	11.10	11.90	12.10	4.00	4.00	1.5	1.50	.75
10	C-D	11.40	12.20	12.10	4.00	4.00	1.5	1.60	.80
12	A-B	13.20	14.00	14.20	4.00	4.00	1.5	1.60	.80
12	C-D	13.50	14.30	14.20	4.00	4.00	1.5	1.70	.85
14	A-B	15.30	16.10	16.10	4.00	4.00	1.5	1.70	.85
14	C-D	15.65	16.45	16.45	4.00	4.00	1.5	1.80	.90
16	A-B	17.40	18.40	18.40	4.00	4.00	1.75	1.80	.90
16	C-D	17.80	18.80	18.80	4.00	4.00	1.75	1.90	1.00
18	A-B	19.50	20.50	20.50	4.00	4.00	1.75	1.90	.95
18	C-D	19.92	20.92	20.92	4.00	4.00	1.75	2.10	1.05
20	A-B	21.60	22.60	22.60	4.00	4.00	1.75	2.00	1.00
20	C-D	22.06	23.06	23.06	4.00	4.00	1.75	2.30	1.15
24	A-B	25.80	26.80	26.80	4.00	4.00	2.00	2.10	1.05
24	C-D	26.32	27.32	27.32	4.00	4.00	2.00	2.50	1.25
30	A	31.74	32.74	32.74	4.50	4.50	2.00	2.30	1.15
30	B	32.00	33.00	33.00	4.50	4.50	2.00	2.30	1.15
30	C	32.40	33.40	33.40	4.50	4.50	2.00	2.60	1.32
30	D	32.74	33.74	33.74	4.50	4.50	2.00	3.00	1.50

CAST IRON BELL AND SPIGOT PIPE

American Water Works Association, Classes A, B, C, D

 $x = \frac{3}{4}''$ on 3'' to 6'' inclusive. $x = 1''$ on 8'' to 84'' inclusive. $v = \frac{3}{16}''$ on 3'' to 6'' inclusive. $v = \frac{1}{4}''$ on 8'' to 84'' inclusive.

Nom'l Diam. Inches	Classes	Actual Outside Diam. Inches	Diam. of Sockets		Depth of Sockets		A	B	C
			Pipe Inches	Special Castings Inches	Pipe Inches	Special Cast'gs Inches			
36	A	37.96	38.96	38.96	4.50	4.50	2.00	2.50	1.25
36	B	38.30	39.30	39.30	4.50	4.50	2.00	2.80	1.40
36	C	38.70	39.70	39.70	4.50	4.50	2.00	3.10	1.60
36	D	39.16	40.16	40.16	4.50	4.50	2.00	3.40	1.80
42	A	44.20	45.20	45.20	5.00	5.00	2.00	2.80	1.40
42	B	44.50	45.50	45.50	5.00	5.00	2.00	3.00	1.50
42	C	45.10	46.10	46.10	5.00	5.00	2.00	3.40	1.75
42	D	45.58	46.58	46.58	5.00	5.00	2.00	3.80	1.95
48	A	50.50	51.50	51.50	5.00	5.00	2.00	3.00	1.50
48	B	50.80	51.80	51.80	5.00	5.00	2.00	3.30	1.65
48	C	51.40	52.40	52.40	5.00	5.00	2.00	3.80	1.95
48	D	51.98	52.98	52.98	5.00	5.00	2.00	4.20	2.20
54	A	56.66	57.66	57.66	5.50	5.50	2.25	3.20	1.60
54	B	57.10	58.10	58.10	5.50	5.50	2.25	3.60	1.80
54	C	57.80	58.80	58.80	5.50	5.50	2.25	4.00	2.15
54	D	58.40	59.40	59.40	5.50	5.50	2.25	4.40	2.45
60	A	62.80	63.80	63.80	5.50	5.50	2.25	3.40	1.70
60	B	63.40	64.40	64.40	5.50	5.50	2.25	3.70	1.90
60	C	64.20	65.20	65.20	5.50	5.50	2.25	4.20	2.25
60	D	64.82	65.82	65.82	5.50	5.50	2.25	4.70	2.60
72	A	75.34	76.34	76.34	5.50	5.50	2.25	3.80	1.87
72	B	76.00	77.00	77.00	5.50	5.50	2.25	4.20	2.20
72	C	76.88	77.88	77.88	5.50	5.50	2.25	4.60	2.64
84	A	87.54	88.54	88.54	5.50	5.50	2.50	4.10	2.10
84	B	88.54	89.54	89.54	5.50	5.50	2.50	4.50	2.60

CAST IRON BELL AND SPIGOT PIPE

*Standard Thickness and Weights**American Water Works Association, Classes E, F, G, H**For Fire Lines and other High Pressure Service*

Nominal Inside Diameter Inches	CLASS E 500-FEET HEAD 217 POUNDS PRESSURE			CLASS F 600-FEET HEAD 260 POUNDS PRESSURE			Approx. Lbs. Lead per Joint	Approx. Lbs. Hemp per Joint
	Thick- ness Inches	Approximate Weight Per		Thick- ness Inches	Approximate Weight Per			
		Foot	Length		Foot	Length		
6	.58	41.7	500	.61	43.3	520	21.9	.22
8	.66	61.7	740	.71	65.7	790	28.2	.28
10	.74	86.3	1035	.80	92.1	1105	34.5	.34
12	.82	113.8	1365	.89	122.1	1465	40.8	.40
14	.90	145.0	1740	.99	157.5	1890	47.1	.46
16	.98	179.6	2155	1.08	195.4	2345	53.4	.52
18	1.07	220.4	2645	1.17	238.4	2860	59.7	.57
20	1.15	263.0	3155	1.27	286.3	3435	66.0	.65
24	1.31	359.6	4315	1.45	392.9	4715	79.4	.78
30	1.55	521.7	6260	1.73	585.4	7025	122.9	.93
36	1.80	725.0	8700	2.02	820.0	9840	146.7	1.11

Nominal Inside Diameter Inches	CLASS G 700-FEET HEAD 304 POUNDS PRESSURE			CLASS H 800-FEET HEAD 347 POUNDS PRESSURE			Approx. Lbs. Lead per Joint	Approx. Lbs. Hemp per Joint
	Thick- ness Inches	Approximate Weight Per		Thick- ness Inches	Approximate Weight Per			
		Foot	Length		Foot	Length		
6	.65	47.1	565	.69	49.6	595	21.9	.22
8	.75	70.8	850	.80	75.0	900	28.2	.28
10	.86	100.9	1210	.92	106.7	1280	34.5	.34
12	.97	135.4	1625	1.04	143.8	1725	40.8	.40
14	1.07	174.2	2090	1.16	186.7	2240	47.1	.46
16	1.18	219.2	2620	1.27	232.5	2790	53.4	.52
18	1.28	267.1	3205	1.39	286.7	3440	59.7	.57
20	1.39	320.8	3850	1.51	344.6	4135	66.0	.65

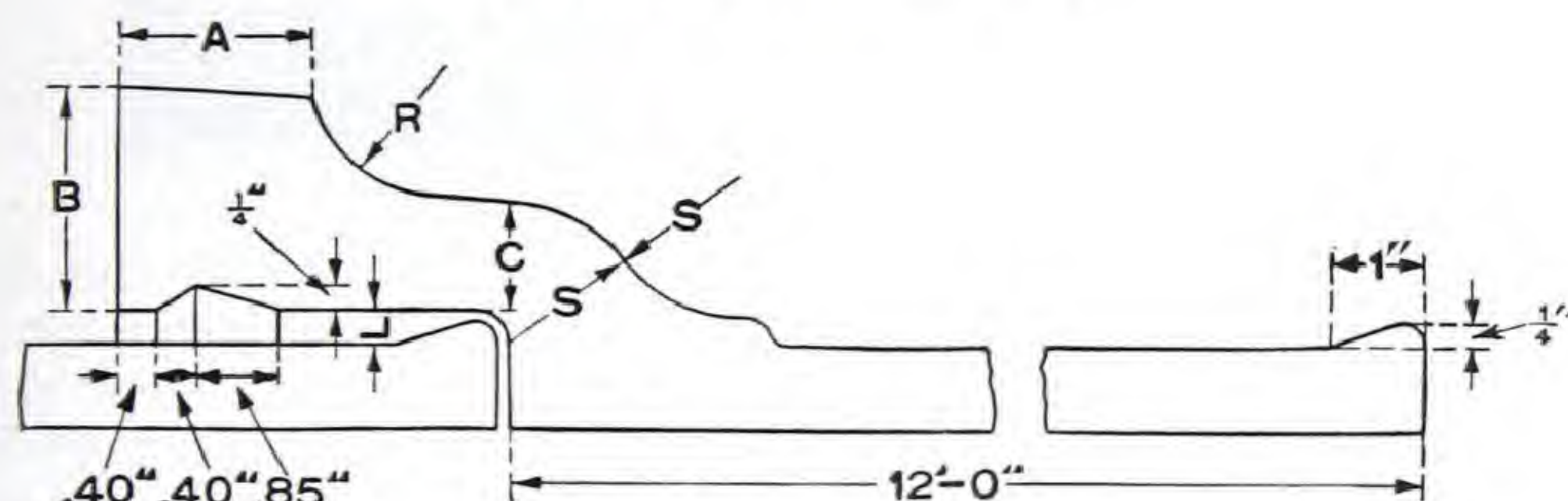
All Lengths to lay 12'-0". All weights are approximate.
 Weights per foot include allowance for bell.
 All high pressure pipe is tested to 500 pounds.

CAST IRON BELL AND SPIGOT PIPE

Dimensions

American Water Works Association, Classes E, F, G, H

For High Pressure Service



$$S = C + L$$

Nominal Diam. Inches	Classes	Actual Outside Diam. Inches	Diam. of		A	B	C	R
			Pipe and Specials	Depth of Sockets Pipe and Specials				
6	E-F	7.22	8.02	4.00	1.50	1.75	.75	1.10
6	G-H	7.38	8.18	4.00	1.50	1.85	.85	1.10
8	E-F	9.42	10.22	4.00	1.50	1.85	.85	1.10
8	G-H	9.60	10.40	4.00	1.50	1.95	.95	1.10
10	E-F	11.60	12.40	4.50	1.75	1.95	.95	1.10
10	G-H	11.84	12.64	4.50	1.75	2.05	1.05	1.10
12	E-F	13.78	14.58	4.50	1.75	2.05	1.05	1.10
12	G-H	14.08	14.88	4.50	1.75	2.20	1.20	1.10
14	E-F	15.98	16.78	4.50	2.00	2.15	1.15	1.10
14	G-H	16.32	17.12	4.50	2.00	2.35	1.35	1.10
16	E-F	18.16	18.96	4.50	2.00	2.30	1.25	1.15
16	G-H	18.54	19.34	4.50	2.00	2.55	1.45	1.15
18	E-F	20.34	21.14	4.50	2.25	2.45	1.40	1.15
18	G-H	20.78	21.58	4.50	2.25	2.75	1.65	1.15
20	E-F	22.54	23.34	4.50	2.25	2.55	1.50	1.15
20	G-H	23.02	23.82	4.50	2.25	2.85	1.75	1.20
24	E-F	26.90	27.90	5.00	2.25	2.85	1.70	1.20
30	E	33.10	34.10	5.00	2.25	3.25	1.80	1.50
30	F	33.46	34.46	5.00	2.25	3.50	2.00	1.55
36	E	39.60	40.60	5.00	2.25	3.70	2.05	1.70
36	F	40.04	41.04	5.00	2.25	4.00	2.30	1.80

CAST IRON BELL AND SPIGOT PIPE

*deLavaud Centrifugally Cast Pipe**Bell and Plain, or Plain Ends*

Probably the outstanding feature of deLavaud centrifugally cast, cast iron pipe is the remarkable increase in strength due to the process of manufacture. While the metal in pipe cast in the sand is required to stand a 20,000 pound per square inch tensile test, the metal in centrifugally cast pipe is required to stand a 30,000 pound per square inch tensile test. Actual tests however show that deLavaud pipe will withstand a much greater load than 30,000 pounds per square inch.

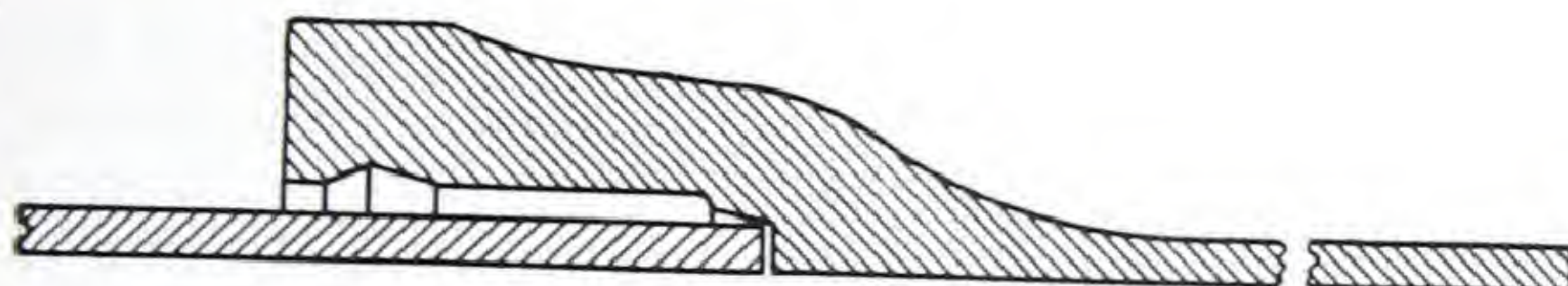
The process of manufacture is briefly as follows:—A metal mold is rotated horizontally and at the same time the molten metal is fed into the mold at a uniform rate of flow so that the rotary force throws the metal against the mold forming the pipe. This eliminates the use of all cores except the small core for forming the inside of the bell.

The centrifugal force, acting on the molten iron, forces from the metal all impurities and gives it a very homogeneous structure. At the same time the cold mold cools the pipe permitting its immediate withdrawal from the mold. After leaving the mold each pipe is taken to the annealing oven where any possible chill or casting strain is removed.

deLavaud pipe is regularly equipped with bell and plain end joints as illustrated above and on opposite page. The construction of the bell is such that in laying the pipe it is only necessary to place the end of one pipe in the bell of the next and slide it forward until it rides upon the taper and automatically centers itself. These joints have shown unusual resistance to blowing out. Pipe can be furnished with plain ends for use where it is desired to bronze weld the joints or where it is desired to use Dresser Couplings.

Grinnell Socket Fittings are suitable for use with deLavaud centrifugally cast Bell and Plain or Plain End pipe. When Bell and Plain End Grinnell Socket Fittings are to be used with deLavaud pipe, orders should specify "BELL AND PLAIN END FOR USE WITH DELAVAUD PIPE."

CAST IRON BELL AND SPIGOT PIPE

*deLavaud Centrifugally Cast Pipe**Classes 50, 150 and 250**Bell and Plain, or Plain Ends*

DIMENSIONS

Nominal Diameter Inches	Class	Thickness of Pipe Inches	Actual Outside Diameter Inches	Diameter of Socket Inches	Depth of Socket Inches
4	50	.26	4.80	5.60	3.30
4	150	.31	4.80	5.60	3.30
4	250	.35	4.80	5.60	3.30
6	50	.30	6.90	7.75	4.00
6	150	.35	6.90	7.75	4.00
6	250	.39	6.90	7.75	4.00
8	50	.31	9.05	9.85	4.50
8	150	.38	9.05	9.85	4.50
8	250	.46	9.05	9.85	4.50
10	50	.34	11.10	11.90	4.50
10	150	.42	11.10	11.90	4.50
10	250	.51	11.10	11.90	4.50
12	50	.37	13.20	14.00	4.50
12	150	.46	13.20	14.00	4.50
12	250	.55	13.20	14.00	4.50

LIST PRICES

Nominal Inside Diameter	LIST PRICES PER FOOT		
	Class 50	Class 150	Class 250
4	1.30	1.50	1.67
6	2.22	2.53	2.76
8	3.07	3.64	4.26
10	4.08	4.89	5.79
12	5.25	6.33	7.41

Prices based on Standard 12'-0" Lengths.

Classes based on equivalent working pressures.

This pipe can be furnished in sizes larger than 12-inch. Prices and dimensions on application.

GRINNELL SOCKET FITTINGS

Explanatory Notes

The Grinnell Socket Fittings described on this and following pages are of an improved design which reduces size and weight and at the same time lessens friction losses. The importance of this development lies not only in lower material cost but in the saving of labor cost due to greater convenience in installation.

These advances in design have been secured without any sacrifice of strength as is clearly shown by the fact that these new fittings have been approved for fire protection work by the Underwriters' Laboratories and the Mutual Insurance Companies after their usual rigid hydraulic tests of 750 lbs. In fact many of these fittings stood a test of 1,000 lbs. without bursting. This shows a large factor of safety in the bursting strength of this line of fittings which makes them in every way adaptable for use by municipal and privately controlled water works. They are also suitable for general underground purposes.

Before starting to design these fittings we made a series of experiments with socket fittings using various radii to determine which would give the least resistance to water flow. These tests established the fact that a medium radius would give less resistance than a larger radius. These findings were checked against similar tests made by the Underwriters' Laboratories. The mutual confirmatory nature of the results allowed us to design a much more compact fitting than has been usual in this class of work. Its value is especially pronounced in making connections in limited spaces.

While on the following pages we give detailed descriptions of Grinnell Socket Fittings, certain features warrant special mention as follows:—

All socket and spigot dimensions of Grinnell Socket Fittings are the same as American Water Works Association Standard Class "D" Pipe, while wall thicknesses are the same as Class "D" Pipe and Fittings.

Grinnell Socket Fittings are suitable for use with deLavaud centrifugally cast Bell and Plain or Plain End pipe. When Bell and Plain End Grinnell Socket Fittings are to be used with deLavaud pipe, order should specify "BELL AND PLAIN END FOR USE WITH deLAVAUD PIPE."

Although Grinnell Socket Fittings are listed for 150 pounds working pressure, as approved by the Underwriters' Laboratories and the Mutual Insurance Companies, they are suitable for 173 pounds water pressure, the working pressure specified for American Water Works Association Class "D" Pipe and Fittings.

Grinnell Socket Fittings are sold by weight, with the exception of Warren Couplings which are sold by List Prices. Weights published are approximate weights. Those for Caps, Plugs, Sleeves and Flanged Sockets are the same as published for American Water Works Association Class "D" Fittings. Those for Flange and Spigot Pieces are for Classes "C" and "D".

The specifications, approved by the Underwriters' Laboratories, under which Grinnell Socket Fittings are made state that no casting shall be accepted the weight of which shall be less than the standard weight by more than 10 per cent for pipes 12 inches or less in diameter, and no excess above the standard weight of more than the above percentage will be charged for.

All Grinnell Socket Fittings are coated inside and out with coal-tar pitch varnish in accordance with the section on "Coating" contained in the specifications of the American Water Works Association.

CONNECTIONS THROUGH BUILDING WALLS

Long Socket $\frac{1}{4}$ Bends, Bell and Spigot, Figure No. 505 and Flange and Spigot, Figure No. 506 are especially to be noted. These fittings were designed to be used in extending cast iron pipes under or through the foundation walls of buildings. The long spigot end keeps the lead joint out of the wall and far enough from the wall so that the joint may be readily poured and caulked.

The Long Socket $\frac{1}{4}$ Bend, Bell and Spigot, is ordinarily used in connection with a Flange and Spigot Piece where the supply enters the building below the lowest floor level. The Long Socket $\frac{1}{4}$ Bend, Flange and Spigot, is used where the supply enters the building above the lowest floor level and where the supply pipe is offset immediately inside the building wall.

The Flange and Spigot Piece, Figure No. 532, is used where the supply enters the building above the lowest floor level and where the supply pipe is not offset immediately inside the building wall.

CONNECTIONS THROUGH PIT WALLS

Flanged Sockets, Figure No. 528, can be used to good advantage where flanged gate valves, check valves and/or meters are to be cut into old or new cast iron pipe lines and where the bell joints can be kept inside the valve or meter pit. The Long Flanged Sockets, Figure No. 529, are 30 inches long from face of flange to bottom of bell and should generally be used in preference to the short Flanged Sockets as the Long Flanged Sockets allow the use of a shorter pit and at the same time keep the bell joints outside of the pit walls.

GRINNELL SOCKET FITTINGS

Socket Bends

150 Lbs. Water Pressure



$\frac{1}{4}$ Bend—B. B.
Fig. No. 501



$\frac{1}{4}$ Bend—B. S.
Fig. No. 502



$\frac{1}{4}$ Bend—F. S.
Fig. No. 503



Long $\frac{1}{4}$ Bend
B. S. Fig. No. 505



$\frac{1}{8}$ Bend—B. B.
Fig. No. 507



$\frac{1}{8}$ Bend—B. S.
Fig. No. 508



$\frac{1}{4}$ Bend—B. S.
with Base
Fig. No. 504



$\frac{1}{16}$ Bend—B. S.
Fig. No. 509



Long $\frac{1}{4}$ Bend
F. S. Fig. No. 506

See pages 368 and 369 for Dimensions and Approximate Weights.
Order by Figure Number.

GRINNELL SOCKET FITTINGS

Socket Tees and Crosses

150 Lbs. Water Pressure

Tee—B. B. B.
Fig. No. 511Tee—B. B. S.
Fig. No. 512Tee—B. S. B.
Fig. No. 513Blow-off Tee—B. B. S.
Fig. No. 515Tee—B. S. S.
Fig. No. 514Cross—B. B. B. B.
Fig. No. 516Cross—B. S. B. B.
Fig. No. 517

See pages 370 and 371 for Dimensions and Approximate Weights.

Order by Figure Number.

GRINNELL SOCKET FITTINGS

*Miscellaneous Fittings***150 Lbs. Water Pressure*

Sleeve (Solid)
Fig. No. 521



Split Sleeve
Fig. No. 522



Plug
Fig. No. 523



Cap
Fig. No. 524



Reducer
Small End Bell
Fig. No. 525



Reducer
Spigot Ends
Fig. No. 526



Reducer
Large End Bell
(Increaser) Fig. No. 527



Flanged Socket
Fig. No. 528



Long Flanged Socket
Fig. No. 529



*Flange and Spigot Piece

Class C—130 Lbs. Water Pressure

Class D—173 Lbs. Water Pressure

1'-6" Long—Fig. Nos. 530-C and 530-D

3'-0" Long—Fig. Nos. 531-C and 531-D

6'-0" Long—Fig. Nos. 532-C and 532-D

See pages 372, 373 and 374 for Dimensions and Approximate Weights.

*Flange and Spigot Pieces regularly furnished in Class C. Class D furnished on order.

Order by Figure Number.

GRINNELL SOCKET FITTINGS

*Warren Couplings**150 Lbs. Water Pressure*

Fig. No. 533

Screw and Spigot Ends.

SIZE, INCHES	LIST PRICES	SIZE, INCHES	LIST PRICES
3 x 3	\$3.25	6 x 6	\$7.75
3 x 2½	3.25	6 x 5	7.75
3 x 2	3.25	6 x 4	7.75
4 x 4	4.75	6 x 3½	7.75
4 x 3½	4.75	6 x 3	7.75
4 x 3	4.75		
4 x 2½	4.75	8 x 8	12.50
4 x 2	4.75	8 x 6	12.50

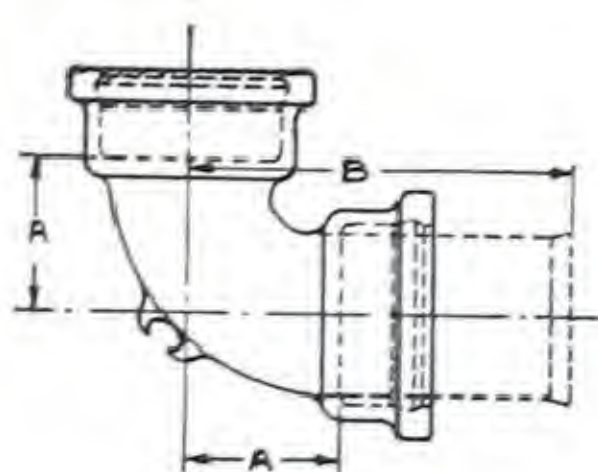
See page 375 for Dimensions.

Order by Figure Number.

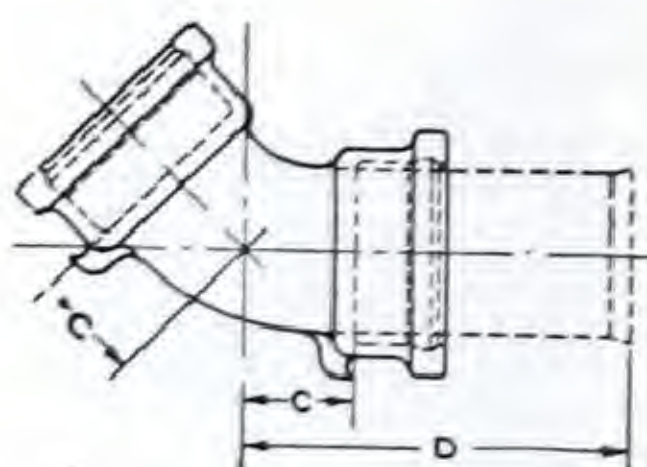
DIMENSIONS AND WEIGHTS

Grinnell Socket Bends

150 Lbs. Water Pressure



Socket $\frac{1}{4}$ Bends
Fig. Nos. 501, 502



Socket $\frac{1}{8}$ Bends
Fig. Nos. 507, 508



Socket $\frac{1}{16}$ Bends
Fig. No. 509

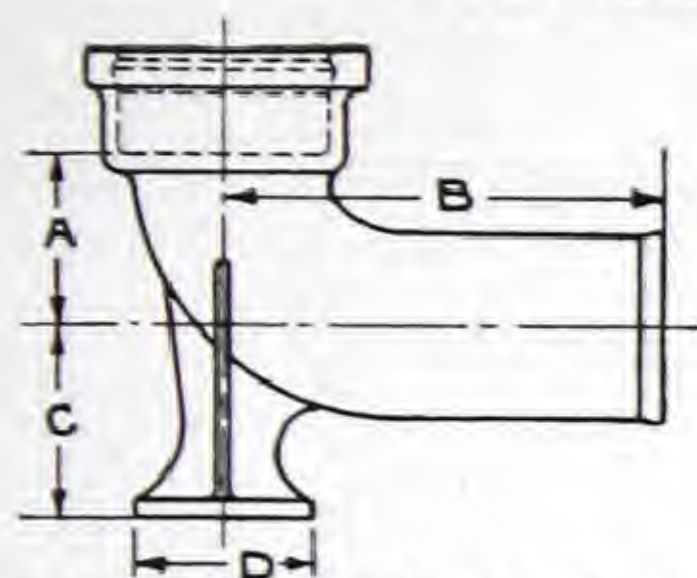
Notes:—All Bells are 4" deep.

Bends not listed can be furnished on order.

SIZE	DIMENSIONS						†APPROXIMATE WEIGHTS				
	A	B	C	D	E	F	$\frac{1}{4}$ Bends		$\frac{1}{8}$ Bends		$\frac{1}{16}$ Bd.
							B. B. Fig. No. 501	B. S. Fig. No. 502	B. B. Fig. No. 507	B. S. Fig. No. 508	B. S. Fig. No. 509
4	5½	15½	2¼	12¼	1	11	71	65	50	55	43
6	6¾	16¾	2¾	12¾	1¼	11¼	106	100	100	92	78
8	8	18	3¼	13¼	1½	11½	149	151	138	125	115
10	9½	19½	4	14	2	12	246	230	214	204	161
12	10¾	20¾	4½	14½	2¼	12¼	317	311	280	272	218

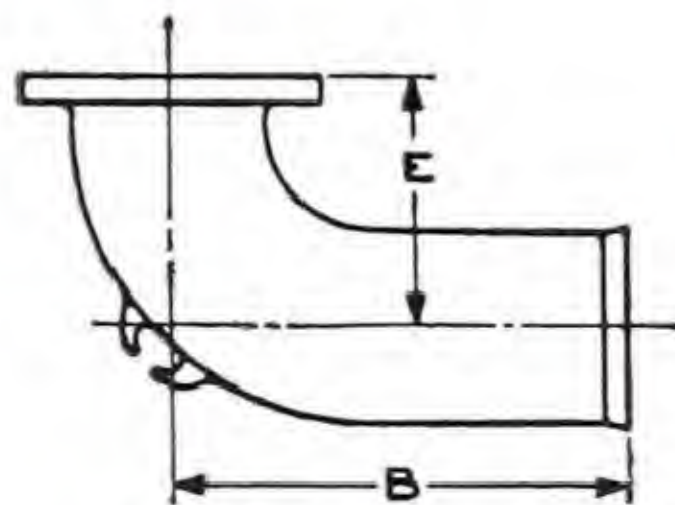
†Weights given above are approximate and subject to revision.
Order by Figure Number.

DIMENSIONS AND WEIGHTS Grinnell Socket Bends (Continued)

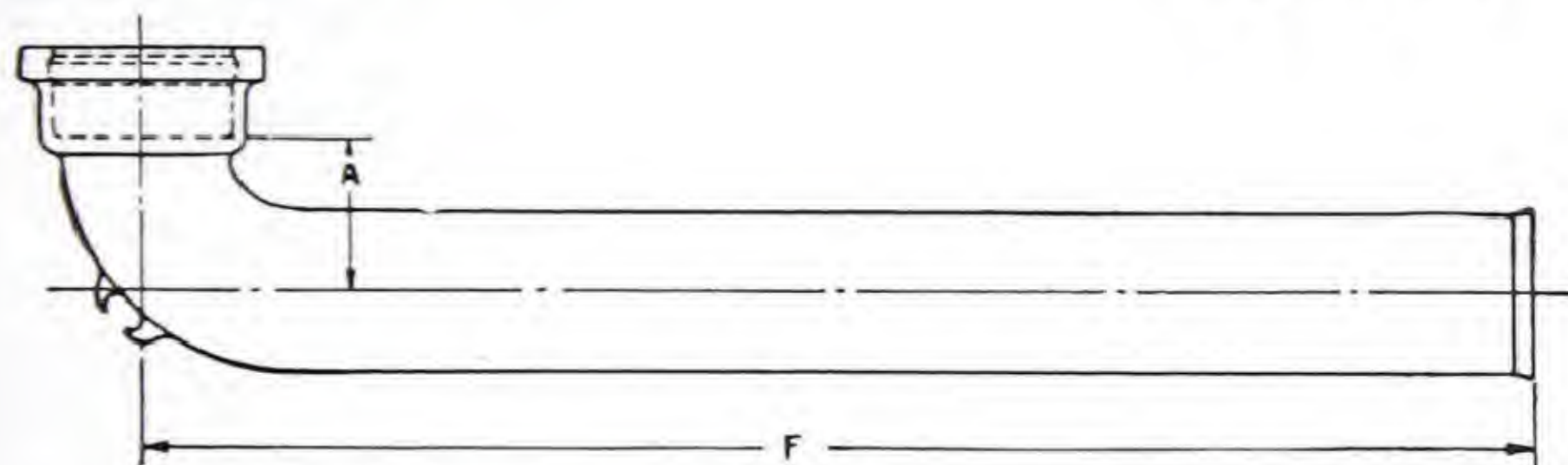


Socket $\frac{1}{4}$ Bend with Base
Fig. No. 504

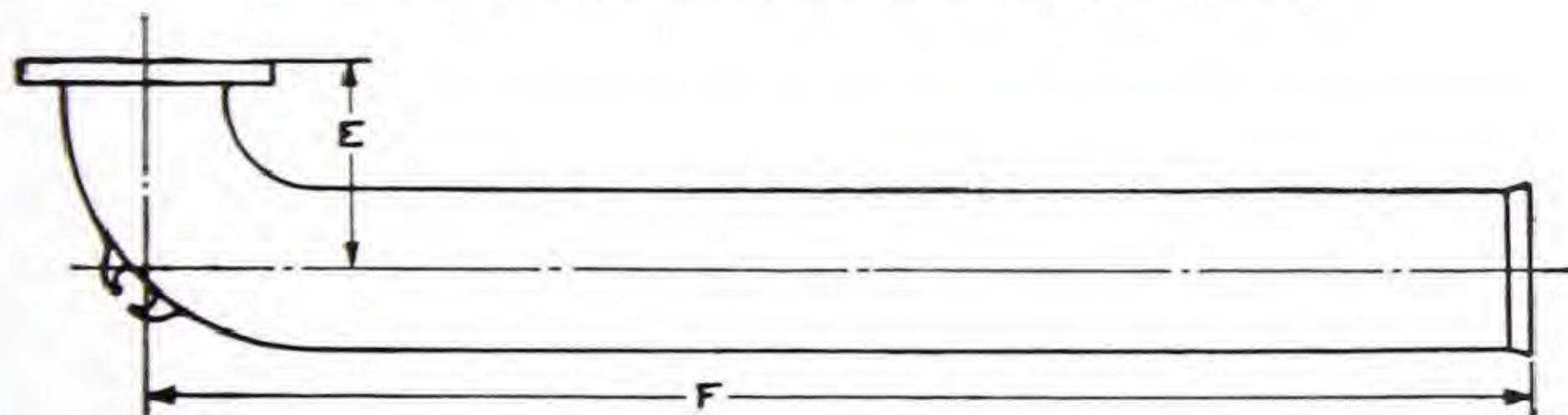
150 Lbs. Water
Pressure



Socket $\frac{1}{4}$ Bend, F. S.
Fig. No. 503



Long Socket $\frac{1}{4}$ Bend, B. S.—Fig. No. 505



Long Socket $\frac{1}{4}$ Bend, F. S.—Fig. No. 506

Notes:—All Bells are 4" deep.

Flanges are American Standard diameter and drilling. Extra Heavy American Standard Flanges furnished on order for 151 to 173 pounds pressure.

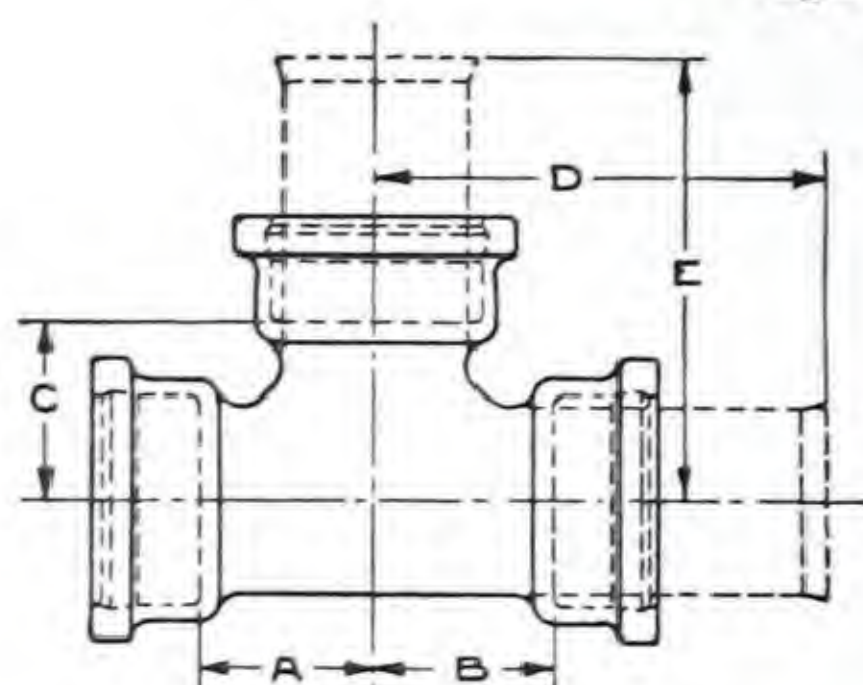
SIZE	DIMENSIONS						†APPROX. WEIGHTS			
	A	B	C	D	E	F	$\frac{1}{4}$ Bd. F. S. Fig. No. 503	B. S. Base Fig. No. 504	LONG $\frac{1}{4}$ Bd. B. S. Fig. No. 505	F. S. Fig. No. 506
4	5 $\frac{1}{2}$	15 $\frac{1}{2}$	6	6 $\frac{1}{2}$	6 $\frac{11}{16}$	60	...	85	150	131
6	6 $\frac{3}{4}$	16 $\frac{3}{4}$	7 $\frac{1}{2}$	7	9 $\frac{1}{8}$	60	87	125	262	256
8	8	18	8 $\frac{3}{4}$	9	11	60	...	175	374	343
10	9 $\frac{1}{2}$	19 $\frac{1}{2}$	10	9	...	...	...	260	...	...
12	10 $\frac{3}{4}$	20 $\frac{3}{4}$	11 $\frac{1}{2}$	11	...	...	...	345	...	...

†Weights given above are approximate and subject to slight revision.
Order by Figure Number.

DIMENSIONS AND WEIGHTS

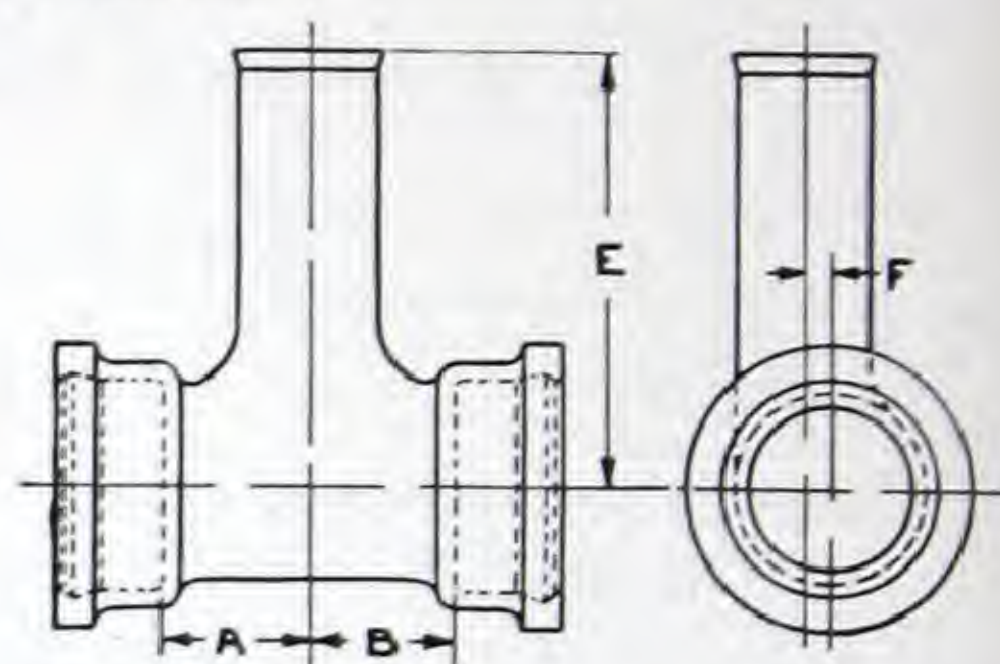
Grinnell Socket Tees

150 Lbs. Water Pressure



Socket Tees

Fig. Nos. 511, 512, 513, 514



Socket Blow-off Tee

Fig. No. 515

Notes:—All Bells are 4" deep.

Tees not listed can be furnished on order.

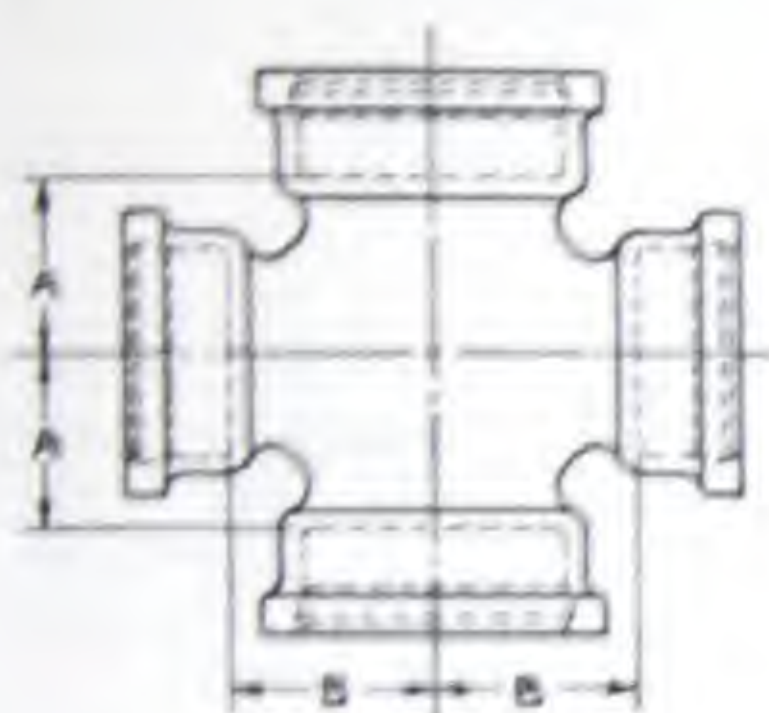
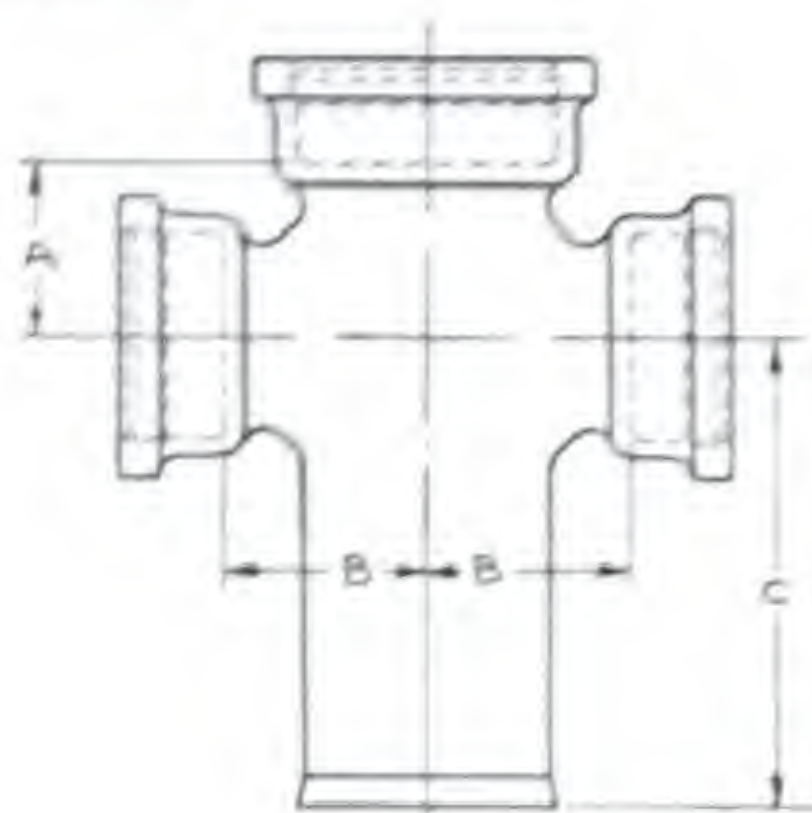
SIZE			DIMENSIONS						†APPROXIMATE WEIGHTS				
			A	B	C	D	E	F	B.B.B. Fig.No. 511	B.B.S. Fig.No. 512	B.S.B. Fig.No. 513	B.S.S. Fig.No. 514	B.B.S. Fig.No. 515
4	4	4	5½	5½	5½	15½	15½	..	95	92	92	88	....
6	6	6	6¾	6¾	6¾	16¾	16¾	..	149	147	147	145	....
6	6	4	5½	5½	6½	15½	16½	1	127	124	124	120	137
8	8	8	8	8	8	18	18	..	221	225	225	219	....
8	8	6	6¾	6¾	7¾	16¾	17¾	..	194	195	199	200	....
8	8	4	5½	5½	7½	15½	17½	2	175	172	172	169	165
8	6	8	8	7¾	8	17¾	18	..	205	202	202	199	....
8	6	6	6¾	6¾	7¾	16¾	17¾	..	175	172	172	168	....
6	6	8	7¾	7¾	6¾	17¾	16¾	..	175	172	172	169	....
10	10	10	9½	9½	9½	19½	19½	..	318	323	323	327	....
10	10	8	8	8	9	18	19	..	274	272	279	276	....
10	10	6	6¾	6¾	8¾	16¾	18¾	..	245	242	250	246	....
10	10	4	5½	5½	8½	15½	18½	3	222	218	227	223	225
12	12	12	10¾	10¾	10¾	20¾	20¾	..	419	428	428	437	....
12	12	10	9½	9½	10½	19½	20½	..	372	377	381	385	....
12	12	8	8	8	10	18	20	..	350	347	359	356	....
12	12	6	6¾	6¾	9¾	16¾	19¾	..	306	303	315	312	....
12	12	4	5½	5½	9½	15½	19½	4	283	281	292	290	285

†Weights given above are approximate and subject to slight revision.
Order by Figure Number.

DIMENSIONS AND WEIGHTS

Grinnell Socket Crosses

150 Lbs. Water Pressure

Socket Cross
Fig. No. 516Socket Cross
Fig. No. 517

Notes:—All Bells are 4 inches deep.

Fittings not listed can be furnished on order.

SOCKET CROSSES

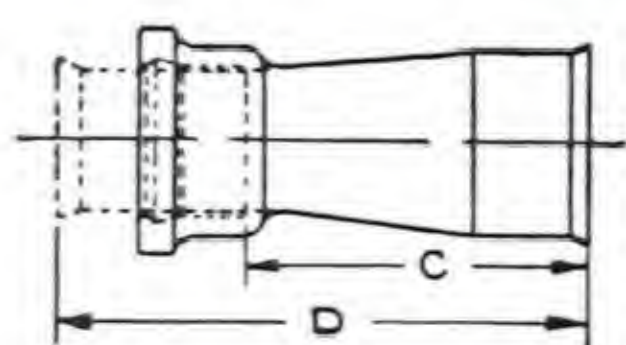
SIZE				DIMENSIONS			†APPROXIMATE WEIGHTS	
				A	B	C	B. R. B. B. Fig. No. 516	B. S. B. R. Fig. No. 517
4	4	4	4	5½	5½	15½	130	127
6	6	6	6	6¾	6¾	16¾	200	197
6	6	4	4	5½	6½	15½	158	155
8	8	8	8	8	8	18	280	277
8	8	6	6	6¾	7¾	16¾	228	225
8	8	4	4	5½	7½	15½	196	193
10	10	10	10	9½	9½	19½	402	407
10	10	8	8	8	9	18	330	335
10	10	6	6	6¾	8¾	16¾	280	285
10	10	4	4	5½	8½	15½	241	246
12	12	12	12	10¾	10¾	20¾	530	539
12	12	10	10	9½	10½	19½	453	462
12	12	8	8	8	10	18	402	411
12	12	6	6	6¾	9¾	16¾	338	347
12	12	4	4	5½	9½	15½	299	308

†Weights given above are approximate and subject to slight revision.
Order by Figure Number.

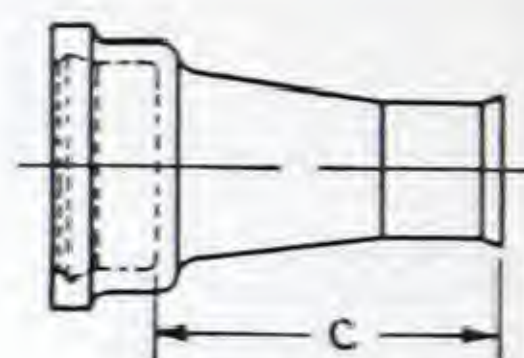
DIMENSIONS AND WEIGHTS

Grinnell Socket Reducers

150 Lbs. Pressure



Socket Reducer
Small End Bell—Fig. No. 525
Spigot Ends —Fig. No. 526



Socket Reducer
Large End Bell—(Increaser)
Fig. No. 527

Notes:—All Bells are 4 inches deep.

All Weights given are approximate.

Fittings not listed below can be furnished on order.

SOCKET REDUCERS

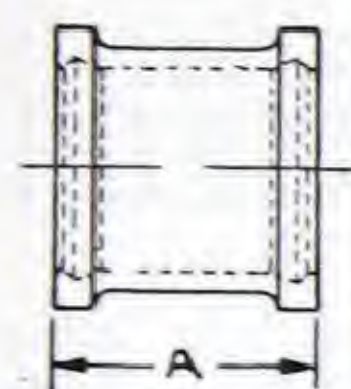
SIZE		DIMENSIONS		†APPROXIMATE WEIGHTS		
		C	D	Fig. No. 525	Fig. No. 526	Fig. No. 527
6	4	14	20	60	49	64
8	4	14	20	73	62	82
8	6	14	20	87	72	92
10	4	18	24	105	94	113
10	6	14	20	105	89	109
10	8	14	20	122	102	121
12	4	22	28	144	133	155
12	6	18	24	144	128	151
12	8	14	20	141	121	144
12	10	14	20	165	146	169

†Weights given above are approximate and subject to slight revision.
Order by Figure Number.

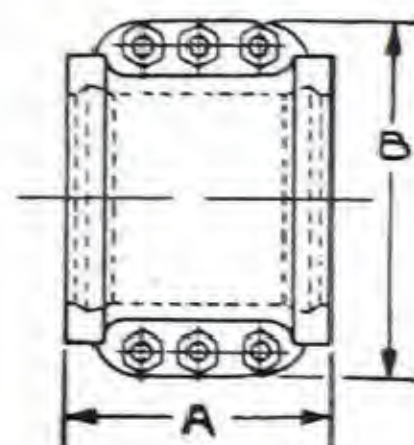
DIMENSIONS AND WEIGHTS

Grinnell Socket Fittings

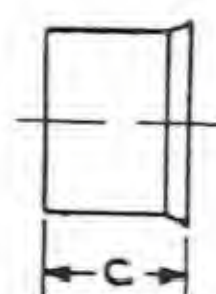
150 Lbs. Water Pressure



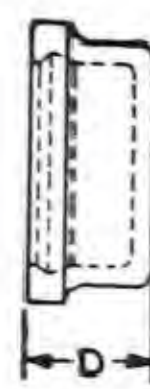
Socket
Sleeve
Fig. No. 521



Split Socket
Sleeve
Fig. No. 522



Socket
Plug
Fig. No. 523



Socket
Cap
Fig. No. 524

Notes:—Bells of Caps are 4" deep.

Socket Plugs in 8, 10 and 12 inch sizes have two ribs.

Approximate Weights given in pounds.

Fittings not listed can be furnished on order.

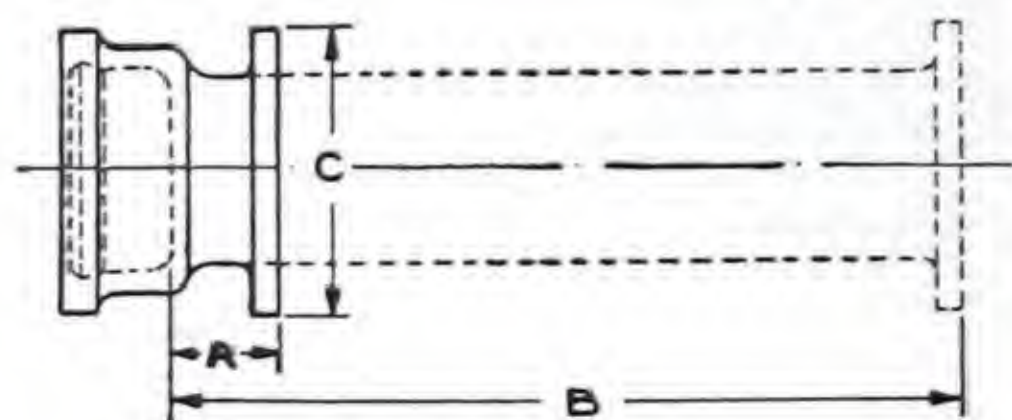
SIZE	DIMENSIONS				APPROXIMATE WEIGHTS			
	A	B	C	D	Sleeve Fig. No. 521	Split Sleeve Fig. No. 522	Plug Fig. No. 523	Cap Fig. No. 524
4	10	12	5½	4⅝	47	72	8	26
6	10	14¼	5½	4¾	68	86	14	40
8	12	16¼	5½	4¾	104	133	24	59
10	12	18½	6	4⅞	123	158	38	81
12	14	21½	6	4⅞	174	222	50	104

Order by Figure Number.

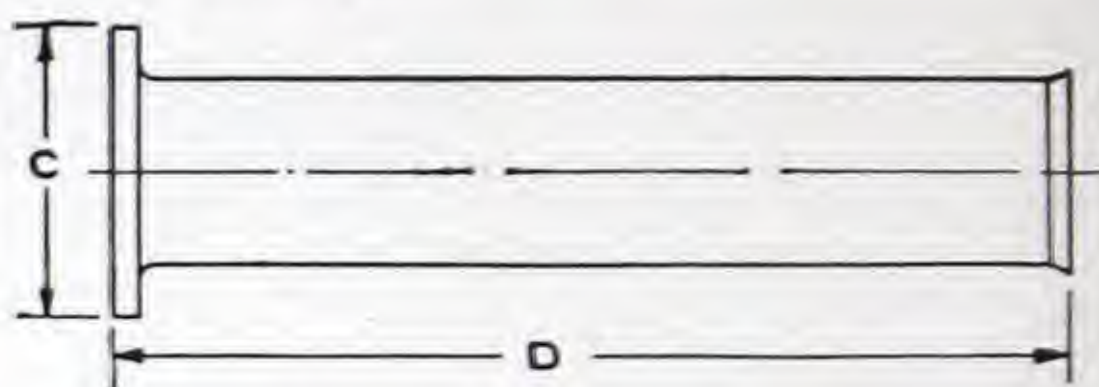
DIMENSIONS AND WEIGHTS

Grinnell Socket Fittings

*150 Lbs. Water Pressure



Flanged Sockets
Fig. Nos. 528, 529



Flange and Spigot Pieces
Fig. Nos. 530-C, 531-C, 532-C
Fig. Nos. 530-D, 531-D, 532-D

Notes:—Bells of Flanged Sockets are 4" deep.

Flanges drilled American Standard Drilling unless otherwise specified. Extra Heavy American Standard Flanges furnished on order for 151 to 173 pounds pressure.

Approximate Weights given in pounds.

Fittings not listed can be furnished on order.

FLANGED SOCKETS

SIZE	DIMENSIONS			APPROX. WEIGHTS	
	A	B	C	Short Fig. No. 528	Long Fig. No. 529
4	4 $\frac{1}{2}$	30	9	42	90
6	4 $\frac{1}{4}$	30	11	59	135
8	4 $\frac{3}{4}$	30	13 $\frac{1}{2}$	93	202
10	4 $\frac{7}{8}$	....	16	125	....
12	4 $\frac{7}{8}$	....	19	169	....

*FLANGE AND SPIGOT PIECES

Class C—130 Lbs. Water Pressure

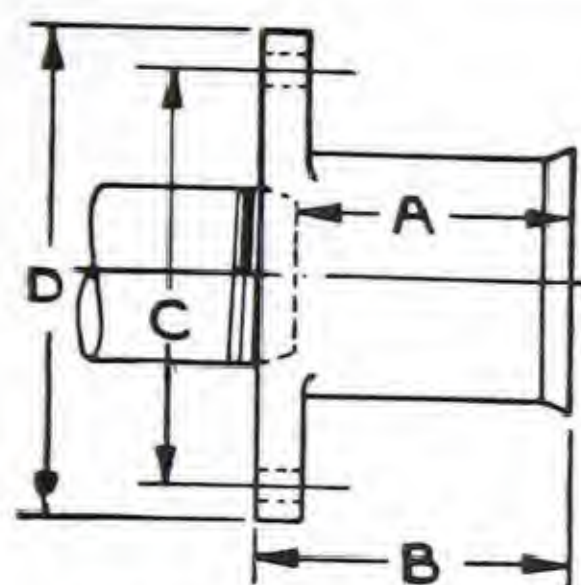
Class D—173 Lbs. Water Pressure

SIZE	DIMENSIONS					APPROX. WEIGHTS					
	C		D			18"		36"		72"	
	150 lbs.	173 lbs.	Fig. No. 530	Fig. No. 531	Fig. No. 532	Cl. C Fig. No. 530-C	Cl. D Fig. No. 530-D	Cl. C Fig. No. 531-C	Cl. D Fig. No. 531-D	Cl. C Fig. No. 532-C	Cl. D Fig. No. 532-D
4	9	10	18	36	72	43	45	75	79	139	147
6	11	12 $\frac{1}{2}$	18	36	72	64	67	113	119	212	225
8	13 $\frac{1}{2}$	15	18	36	72	94	99	166	176	310	329
10	16	17 $\frac{1}{2}$	18	36	72	128	138	227	245	423	459
12	19	20 $\frac{1}{2}$	18	36	72	174	186	302	326	558	606

*Flange and Spigot Pieces regularly furnished in Class C. Class D furnished on order.

Order by Figure Number.

DIMENSIONS
Grinnell Socket Fittings
150 Lbs. Water Pressure



Warren Couplings
Fig. No. 533

SIZE		DIMENSIONS			
		A	B	C	D
3	3	$8\frac{1}{16}$	9	$8\frac{1}{4}$	$10\frac{1}{4}$
3	$2\frac{1}{2}$	$8\frac{1}{8}$	9	$8\frac{1}{4}$	$10\frac{1}{4}$
3	2	$8\frac{5}{16}$	9	$8\frac{1}{4}$	$10\frac{1}{4}$
4	4	$7\frac{15}{16}$	9	$9\frac{3}{4}$	$11\frac{3}{4}$
4	$3\frac{1}{2}$	8	9	$9\frac{3}{4}$	$11\frac{3}{4}$
4	3	$8\frac{1}{16}$	9	$9\frac{3}{4}$	$11\frac{3}{4}$
4	$2\frac{1}{2}$	$8\frac{1}{8}$	9	$9\frac{3}{4}$	$11\frac{3}{4}$
4	2	$8\frac{5}{16}$	9	$9\frac{3}{4}$	$11\frac{3}{4}$
6	6	$7\frac{3}{4}$	9	12	14
6	5	$7\frac{13}{16}$	9	12	14
6	4	$7\frac{15}{16}$	9	12	14
6	$3\frac{1}{2}$	8	9	12	14
6	3	$8\frac{1}{16}$	9	12	14
8	8	$7\frac{5}{8}$	9	$14\frac{1}{4}$	$16\frac{1}{4}$
8	6	$7\frac{3}{4}$	9	$14\frac{1}{4}$	$16\frac{1}{4}$

Order by Figure Number.

SOCKET FITTINGS

Grinnell Socket Test Plugs



Rubber Ring Tapped Plate Body
Socket Test Plug—Fig. No. 534

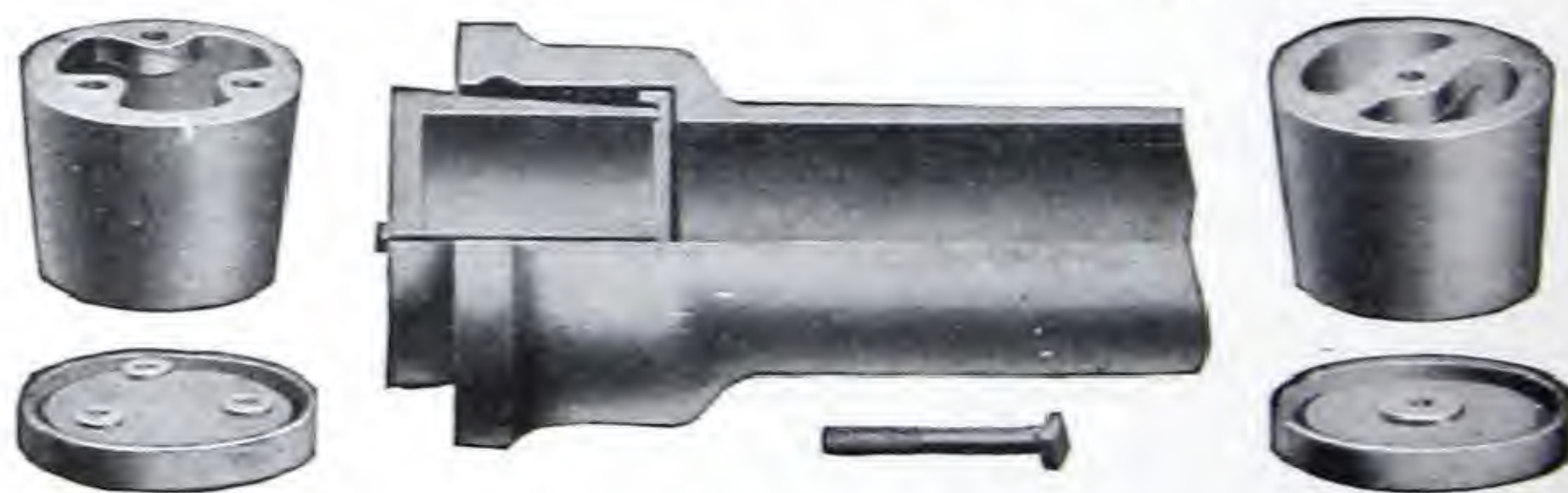
Showing Application
of Socket Test Plug

A simple, practical Test Plug. Easy to install and easy to remove. It is furnished tapped $\frac{3}{4}$ -inch for test pipe connection.

LIST PRICES

Size.....Inches	4	6	8	10	12
Price.....Each	13.00	20.00	25.00	40.00	50.00

Streeter's Patent Pipe Plugs



Streeter's Pipe Plug
Fig. No. 535

A simple, reliable and practical Socket Pipe Plug. For temporary use.

LIST PRICES

Size.....Inches	4	6	8	10	12	14	16	18	20	24
Price.....Each	1.50	2.50	3.50	4.50	5.50	7.50	10.00	15.00	18.00	25.00

Order by Figure Number.

GRINNELL SOCKET CLAMPS

Explanatory Notes

The Grinnell Socket Clamps illustrated on the following pages have been designed to comply with the requirements of the National Board of Fire Underwriters, the Associated Factory Mutual Fire Insurance Companies and the Factory Insurance Association.

An important provision in these requirements has to do with proper strapping to avoid any possibility of joints blowing out and with special reinforcement of joints under certain conditions.

The insurance interests in developing their requirements have outlined in some detail the materials, design and size of clamps, rods and bolts necessary to meet their provisions.

Grinnell Clamps are made from $\frac{1}{2}$ -inch by 2-inch steel, bolts are $\frac{5}{8}$ -inch and all clamp rods are $\frac{3}{4}$ -inch round steel, with the exception of the rods for Clamps Nos. 613, 614, 620 and 621 for the 4-inch Flange and Spigot Pieces. These are $\frac{5}{8}$ -inch round steel to match the size of bolts used in the 4 x 9 flanges.

All clamps, rods, etc., are coated with coal-tar pitch varnish in the same manner as Grinnell Socket Fittings. All exposed threads, however, should be painted with asphaltum after nuts are made up tight.

Some Grinnell Socket Clamps listed are "Friction Clamps," as illustrated in Figure Numbers 602 and 604 shown on page 382, but for each "Friction Clamp" we also list a "Positive Clamp," as illustrated in Figure Numbers 634 and 635 on same cuts.

All Grinnell Socket $\frac{1}{4}$ Bends and Socket $\frac{1}{8}$ Bends are provided with lugs so that clamp rods may be quickly, economically and securely attached for clamping the Bends to pipe or to other fittings.

All Clamps shown for use with Socket Tees and Crosses are designed for straight size Grinnell Fittings. Clamps for reducing sizes will be furnished on order.

We are also equipped to furnish Socket Clamps for use with American Water Works or other patterns of fittings.

GRINNELL SOCKET CLAMPS

Socket Pipe Clamps
Socket 1/4 Bend Clamps



Socket Pipe Clamp
Fig. No. 606



Socket 1/4 Bend Clamps

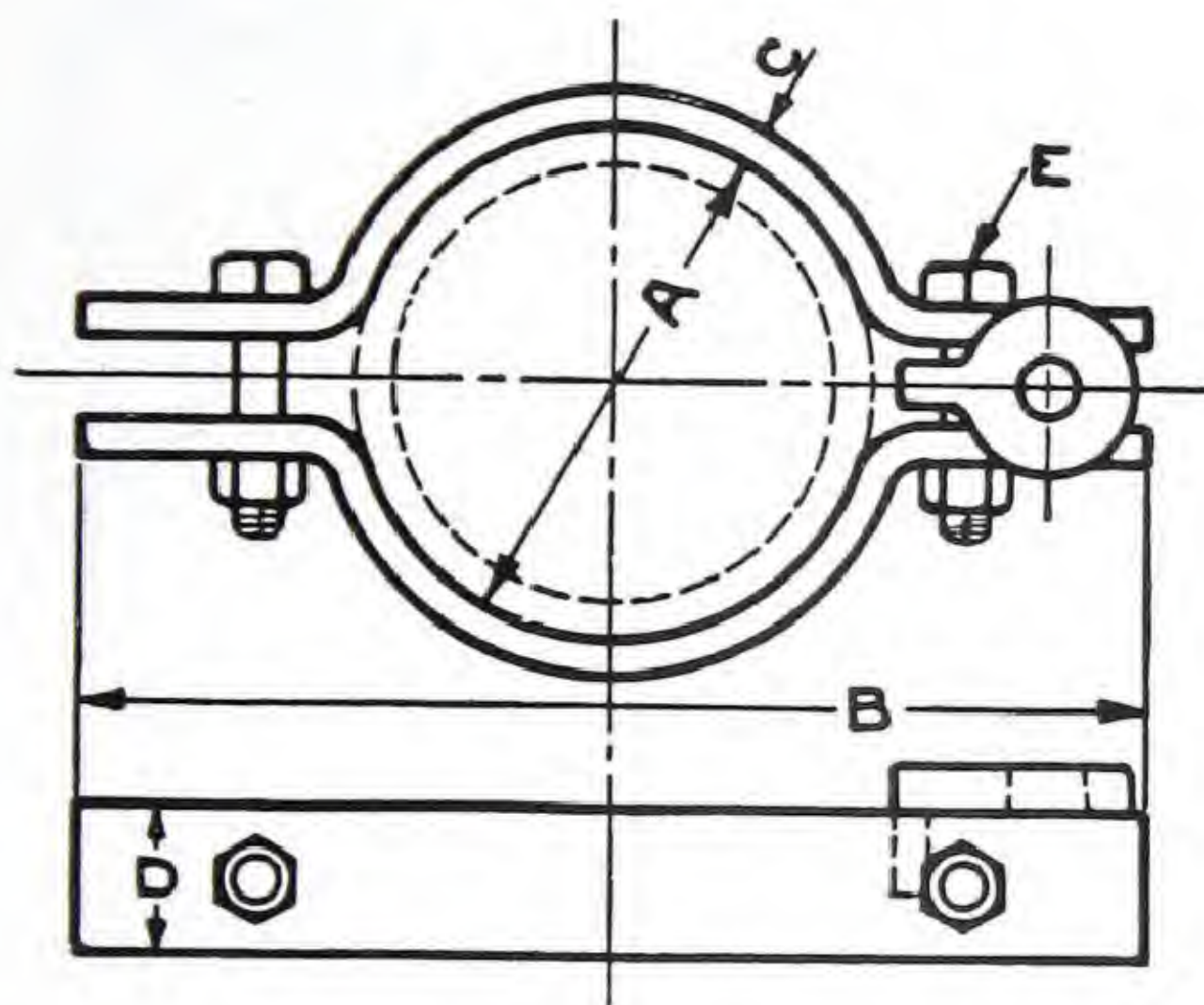
Spigot End—Fig. No. 601

Bell End — Fig. No. 602

Note:—The above illustrations show typical clamps from our complete line of Socket Clamps. See following pages for List Prices, Line Drawings and Dimensions.

Order by Figure Number.

LIST PRICES AND DIMENSIONS

Grinnell Socket Clamps

Socket Clamp—Fig. No. 600
 Socket Clamp Washer—Fig. No. 599

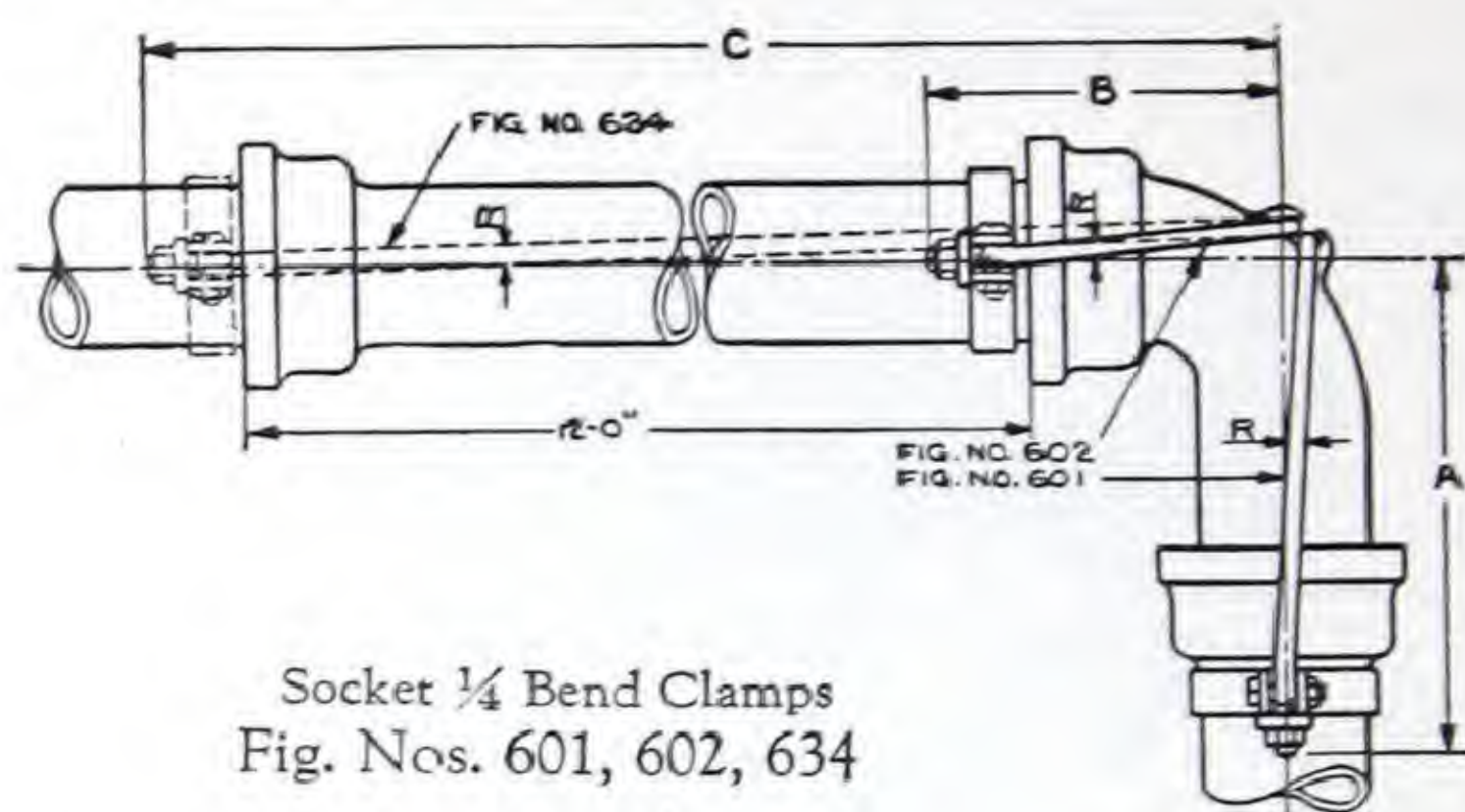
SIZE	LIST PRICES Fig. No. 600	DIMENSIONS				
		A	B	C	D	Bolts E
4	\$.65	5	12 $\frac{1}{8}$	$\frac{1}{2}$	2	$\frac{5}{8}$ x 2 $\frac{3}{4}$
6	.75	7 $\frac{1}{8}$	14 $\frac{3}{8}$	$\frac{1}{2}$	2	$\frac{5}{8}$ x 2 $\frac{3}{4}$
8	.85	9 $\frac{5}{16}$	16 $\frac{5}{8}$	$\frac{1}{2}$	2	$\frac{5}{8}$ x 2 $\frac{3}{4}$
10	1.00	11 $\frac{3}{8}$	18 $\frac{7}{8}$	$\frac{1}{2}$	2	$\frac{5}{8}$ x 2 $\frac{3}{4}$
12	1.25	13 $\frac{1}{2}$	21 $\frac{1}{4}$	$\frac{1}{2}$	2	$\frac{5}{8}$ x 2 $\frac{3}{4}$

Socket Clamp Washers, Fig. No. 599, List Price each.....\$0.10

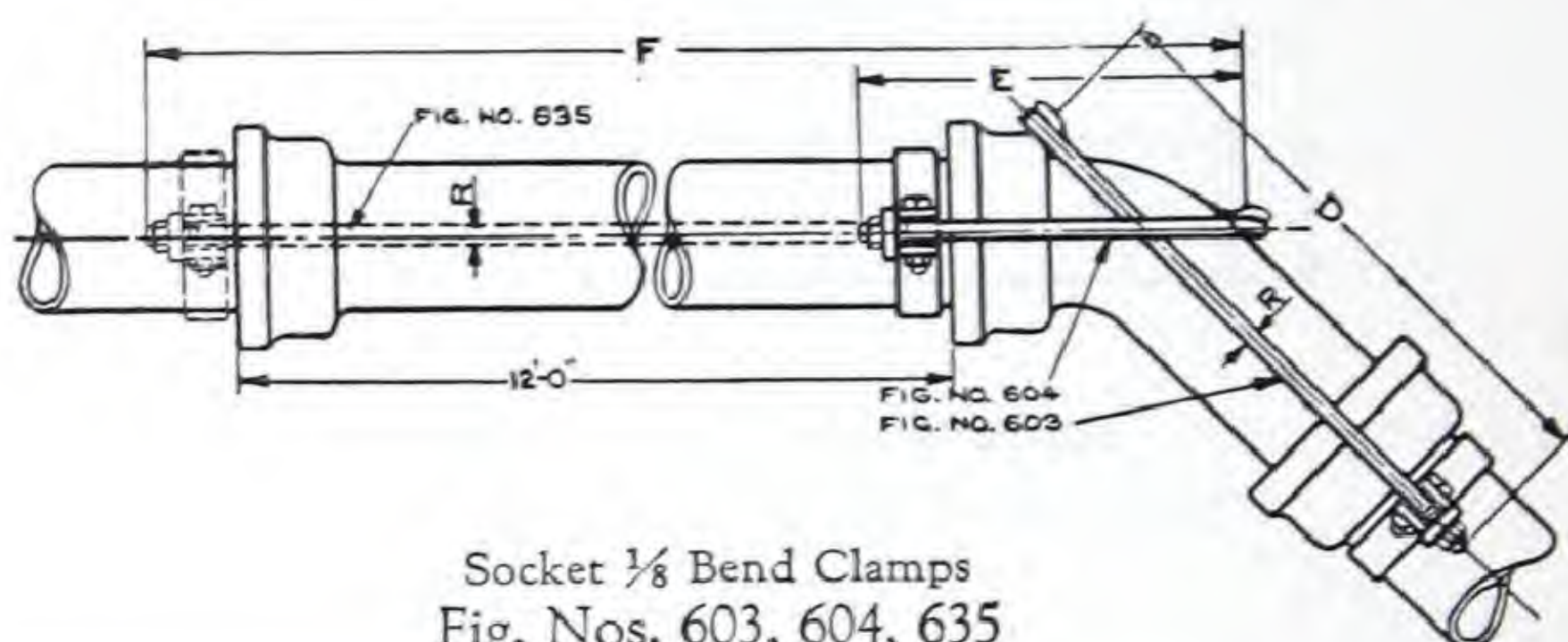
Order by Figure Number.

LIST PRICES AND DIMENSIONS

Grinnell Socket Clamps



Socket $\frac{1}{4}$ Bend Clamps
Fig. Nos. 601, 602, 634



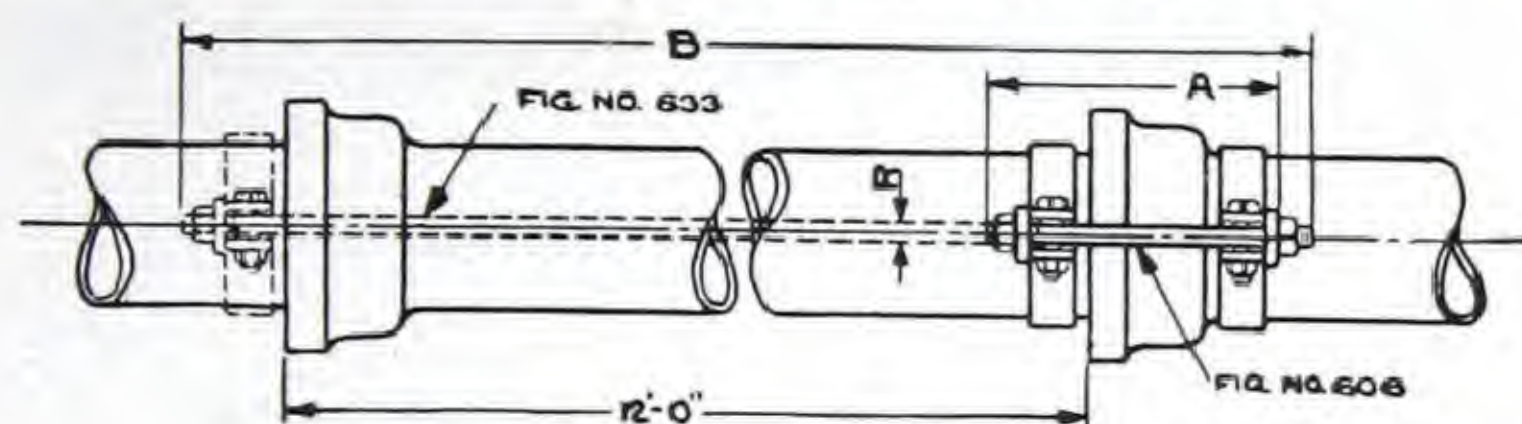
Socket $\frac{1}{8}$ Bend Clamps
Fig. Nos. 603, 604, 635

Size	LIST PRICES			DIMENSIONS						
	Fig. Nos 601 603	Fig. Nos 602 604	Fig. Nos 634 635	A	B	C	D	E	F	R
4	1.35	1.20	2.25	1-9	1-2	13-2	1-11 $\frac{1}{2}$	1-2 $\frac{1}{2}$	13-3	$\frac{3}{4}$
6	1.45	1.35	2.50	1-10 $\frac{1}{2}$	1-3 $\frac{1}{2}$	13-3 $\frac{1}{2}$	2-1	1-4 $\frac{1}{2}$	13-5	$\frac{3}{4}$
8	1.70	1.50	2.75	2-0 $\frac{1}{4}$	1-5	13-5	2-3	1-6 $\frac{1}{2}$	13-7	$\frac{3}{4}$
10	1.90	1.75	3.00	2-2	1-6 $\frac{3}{4}$	13-6 $\frac{3}{4}$	2-5	1-9	13-9	$\frac{3}{4}$
12	2.15	2.00	3.50	2-3 $\frac{3}{4}$	1-8 $\frac{1}{2}$	13-10	2-7	1-11	13-11	$\frac{3}{4}$

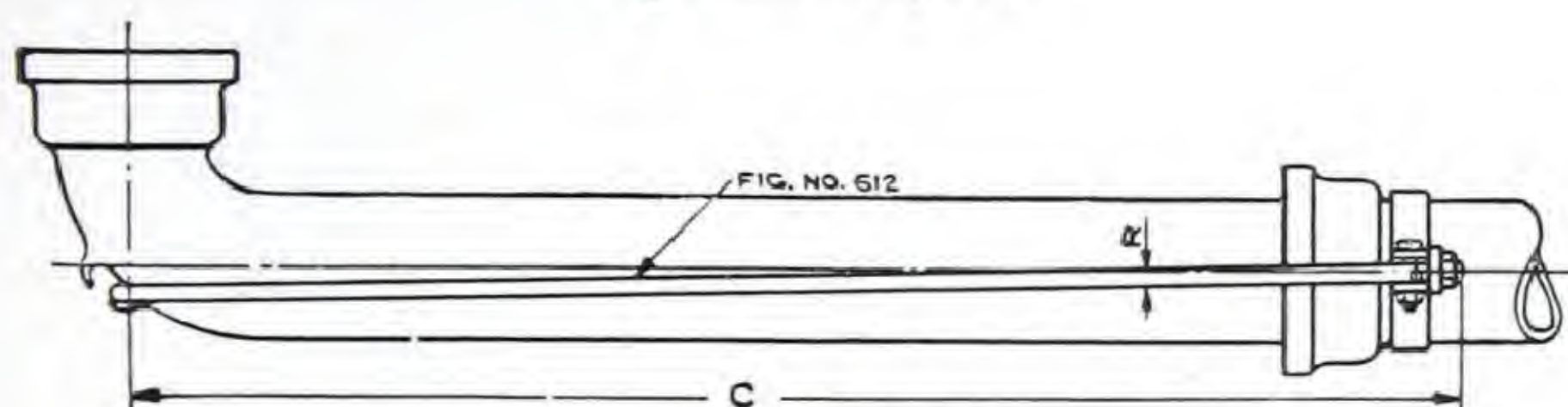
Order by Figure Number.

LIST PRICES AND DIMENSIONS

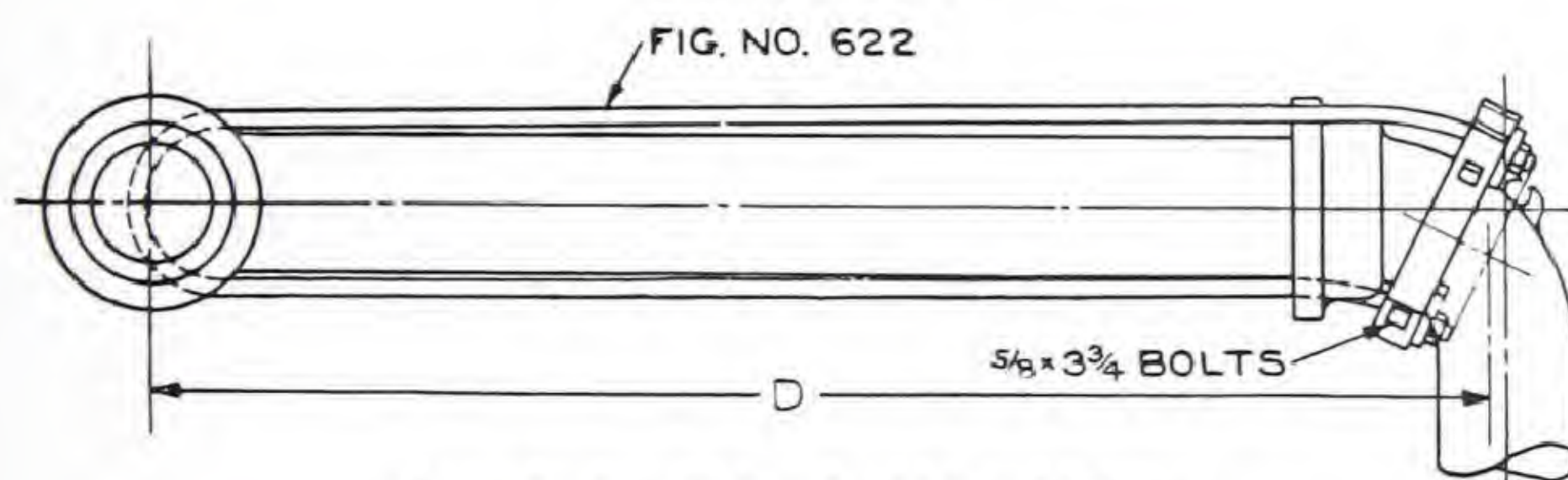
Grinnell Socket Clamps



Socket Pipe Clamps
Fig. Nos. 606, 633



Long Socket $\frac{1}{4}$ Bend Clamp
Fig. No. 612



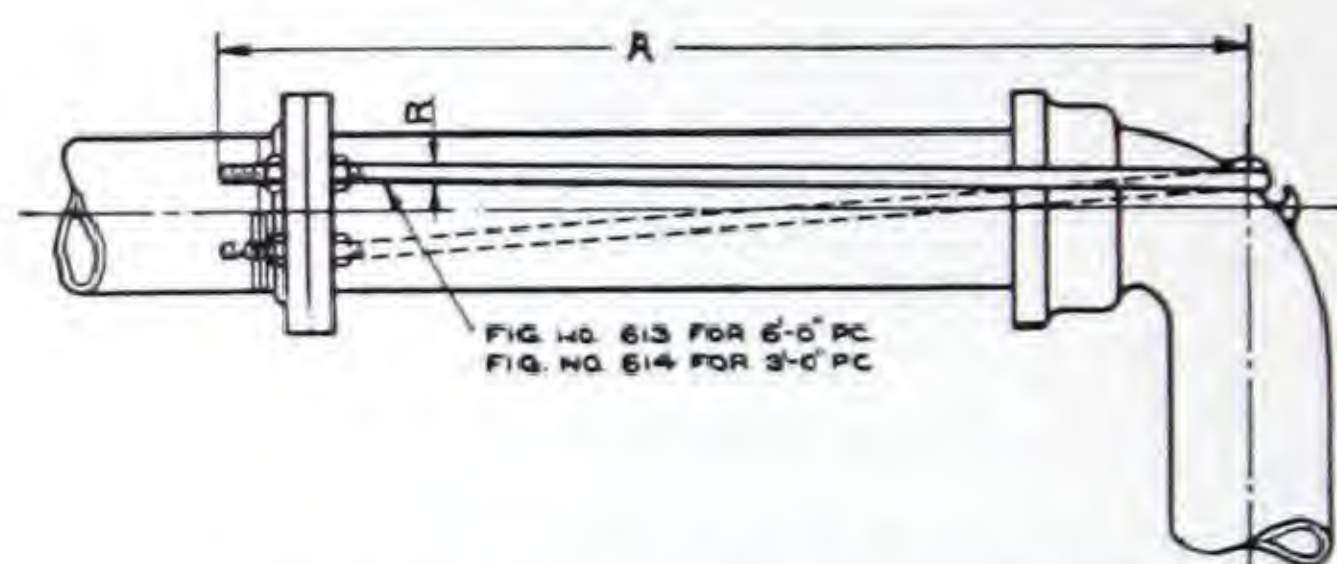
Long Socket $\frac{1}{4}$ Bend— $\frac{1}{4}$ Bend Clamp
Fig. No. 622

Note:—Rods for Clamp Fig. No. 622 are furnished with straight ends of even length, "D."

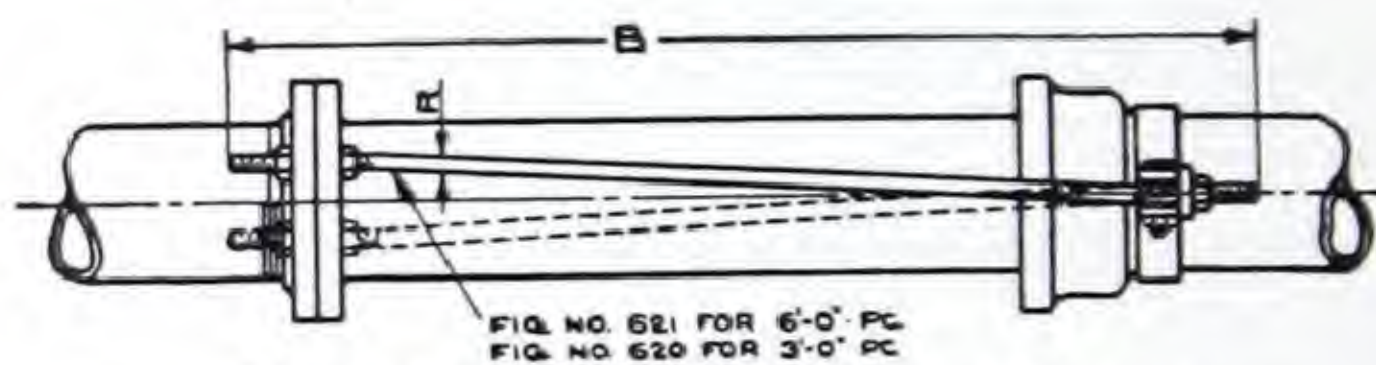
SIZE	LIST PRICES				DIMENSIONS				
	Fig. No. 606	Fig. No. 633	Fig. No. 612	Fig. No. 622	A	B	C	D	R
4	2.00	3.50	1.80	....	1-1 $\frac{1}{2}$	13-3	5-6 $\frac{1}{2}$	....	$\frac{3}{4}$
6	2.25	3.75	2.10	2.10	1-1 $\frac{1}{2}$	13-3	5-6 $\frac{1}{2}$	5-6 $\frac{1}{2}$	$\frac{3}{4}$
8	2.50	4.00	2.25	2.25	1-1 $\frac{1}{2}$	13-3	5-6 $\frac{1}{2}$	5-6 $\frac{1}{2}$	$\frac{3}{4}$
10	3.00	4.50	....	....	1-1 $\frac{1}{2}$	13-3	....	....	$\frac{3}{4}$
12	3.50	5.25	....	....	1-1 $\frac{1}{2}$	13-3	....	....	$\frac{3}{4}$

Order by Figure Number.

LIST PRICES AND DIMENSIONS

Grinnell Socket Clamps

Flange and Spigot—Socket $\frac{1}{4}$ Bend Clamps
Fig. Nos. 613, 614

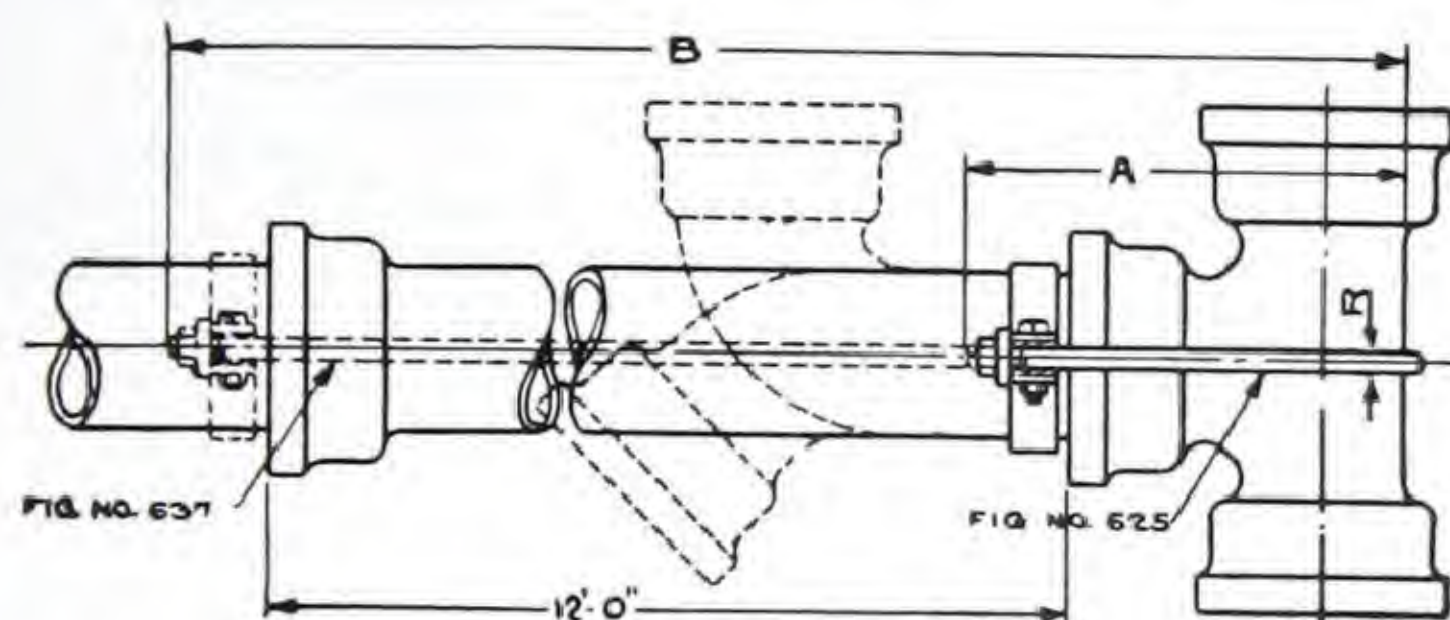


Flange and Spigot—Socket Pipe Clamps
Fig. Nos. 620, 621

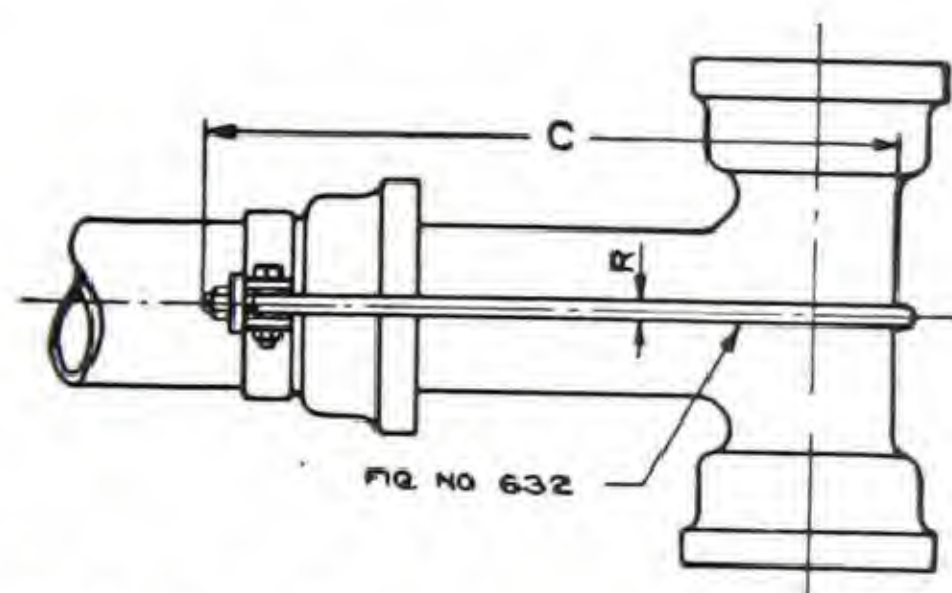
SIZE	LIST PRICES				DIMENSIONS				
	Fig.No. 613	Fig.No. 614	Fig.No. 621	Fig.No. 620	A		B		R
					6' Pc.	3' Pc.	6' Pc.	3' Pc.	
4	1.50	.90	2.10	1.80	6-9	3-9	6-9 $\frac{1}{4}$	3-9 $\frac{1}{4}$	$\frac{5}{8}$
6	1.70	1.10	2.50	2.00	7-0	4-0	6-9 $\frac{1}{4}$	3-9 $\frac{1}{4}$	$\frac{3}{4}$
8	1.70	1.10	2.70	2.20	7-0	4-0	6-9 $\frac{1}{4}$	3-9 $\frac{1}{4}$	$\frac{3}{4}$
10	2.25	1.50	3.00	2.50	7-4	4-4	6-9 $\frac{1}{2}$	3-9 $\frac{1}{2}$	$\frac{3}{4}$
12	2.25	1.50	3.50	3.00	7-4	4-4	6-9 $\frac{1}{2}$	3-9 $\frac{1}{2}$	$\frac{3}{4}$

Order by Figure Number.

LIST PRICES AND DIMENSIONS

Grinnell Socket Clamps

Socket Tee Clamps
Fig. Nos. 625, 637



Socket Tee Clamp for Spigot Outlet Tee
Fig. No. 632

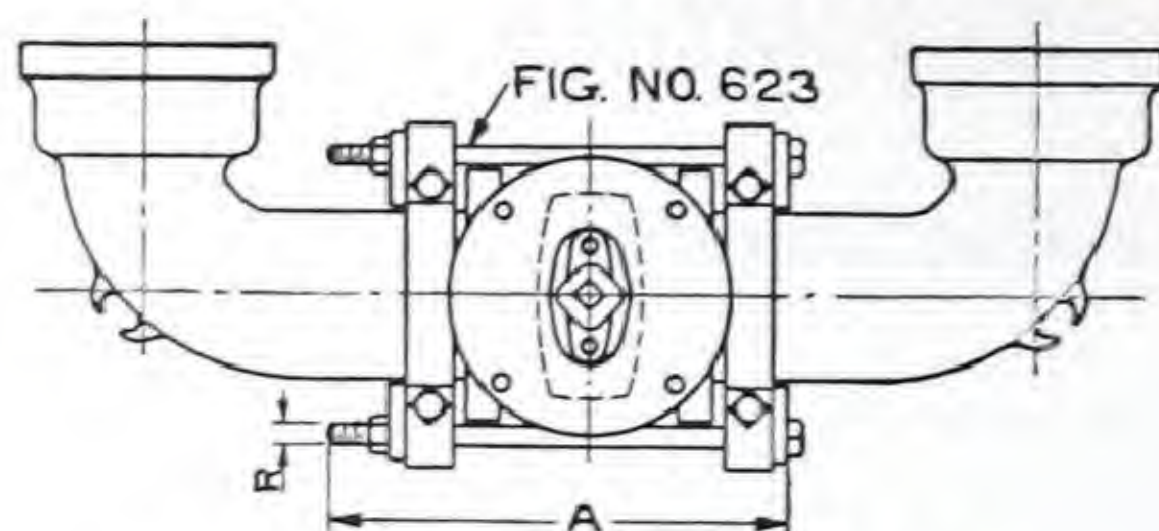
SIZE	LIST PRICES			DIMENSIONS			
	Fig. No. 625	Fig. No. 637	Fig. No. 632	A	B	C	R
4	1.35	2.30	.....	1-6	13-4½	.....	¾
6	1.45	2.60	2.00	1-8½	13-7	2-1½	¾
8	1.80	2.85	2.25	1-9	13-9	2-3½	¾
10	2.00	3.25	.....	2-0	14-0	.....	¾
12	2.50	3.75	.....	2-2	14-2	.....	¾

Above clamps are for straight size fittings. Clamps for reducing sizes furnished on order.

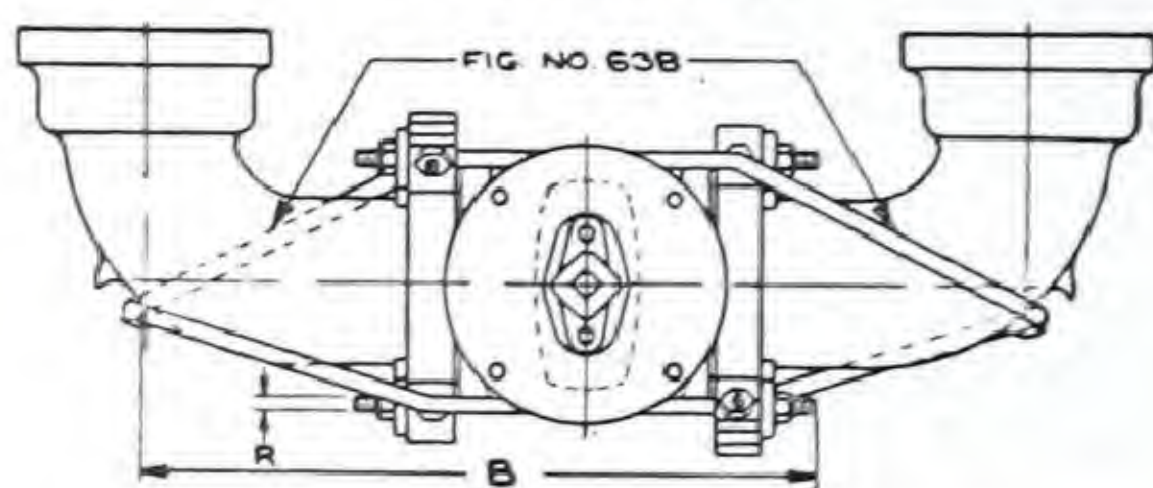
Order by Figure Number.

LIST PRICES AND DIMENSIONS

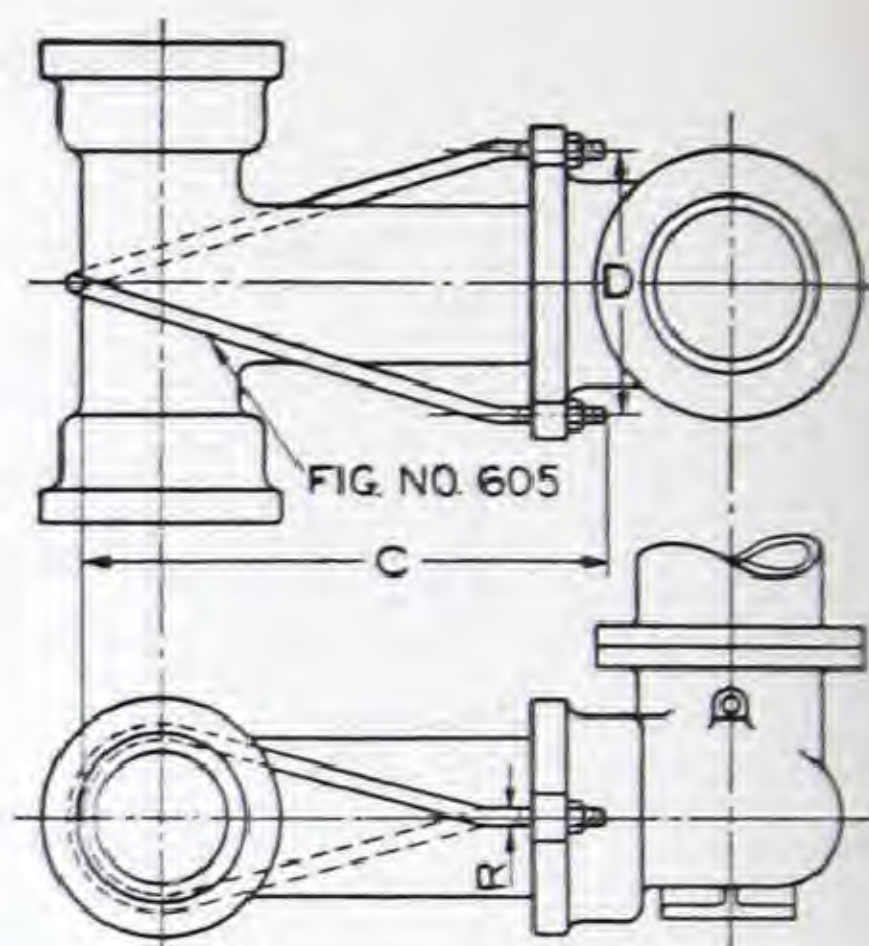
Grinnell Socket Clamps



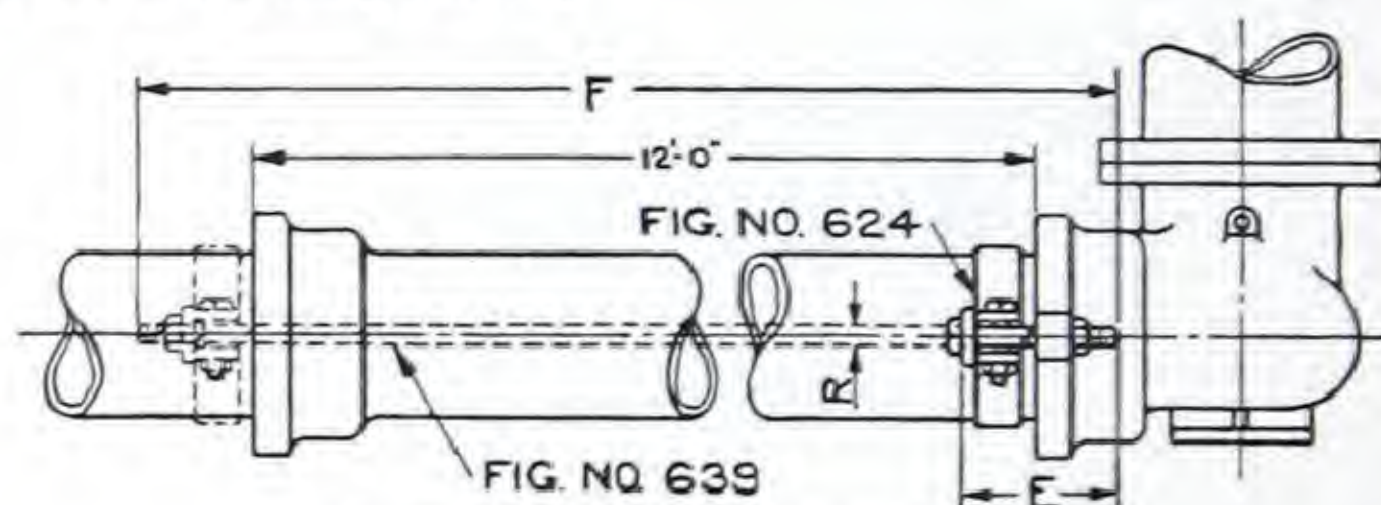
P. I. Valve—Socket $\frac{1}{4}$ Bend Clamp
Fig. No. 623



P. I. Valve—Socket $\frac{1}{4}$ Bend Clamp
Fig. No. 638
(One No. 638 Clamp shown)



Socket Tee—Hydrant Clamp
Fig. No. 605

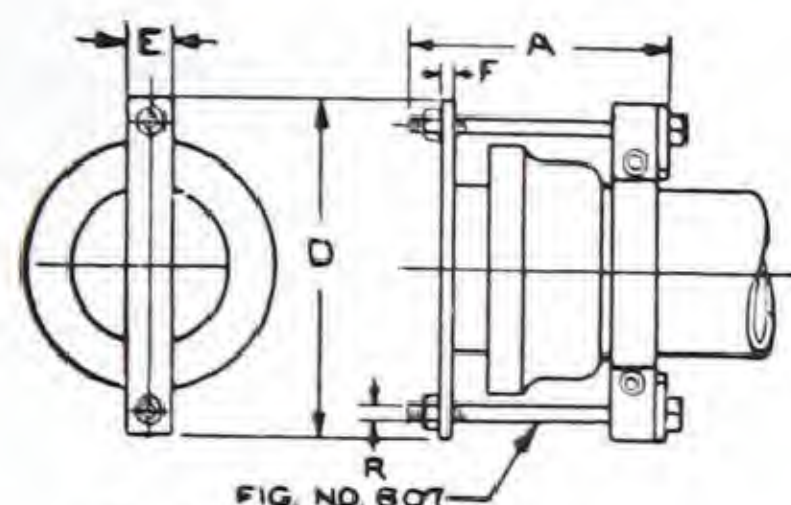


Socket Pipe—Hydrant Clamps
Fig. Nos. 624, 639

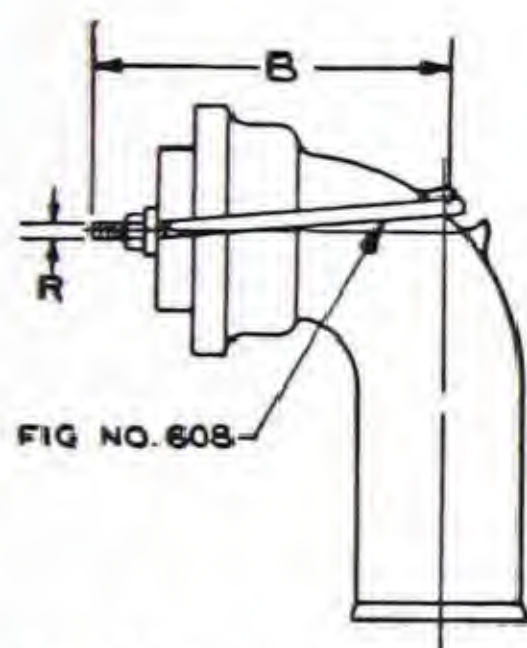
SIZE	LIST PRICES					DIMENSIONS						
	Fig. No. 623	Fig. No. 638	Fig. No. 605	Fig. No. 624	Fig. No. 639	A	B	C	D	E	F	R
4	2.25	3.00	....	1.00	....	1-5	2-8	....	....	5 $\frac{1}{2}$	....	$\frac{3}{4}$
6	2.50	4.00	.60	1.20	3.00	1-7	2-8	1-8	12	5 $\frac{1}{2}$	12-8	$\frac{3}{4}$
8	2.75	5.00	....	1.45	3.25	1-9	2-8	....	....	5 $\frac{1}{2}$	12-8	$\frac{3}{4}$
8x6	....	....	.65	....	....	....	....	1-10	12	....	....	$\frac{3}{4}$

Order by Figure Number.

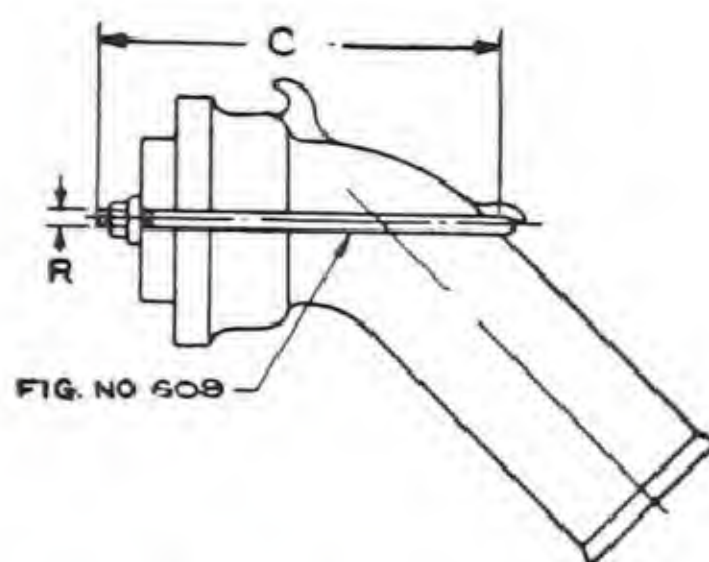
LIST PRICES AND DIMENSIONS

Grinnell Socket Clamps

Socket Pipe—Plug Clamp
Fig. No. 607



Socket $\frac{1}{4}$ Bend—Plug Clamp
Fig. No. 608

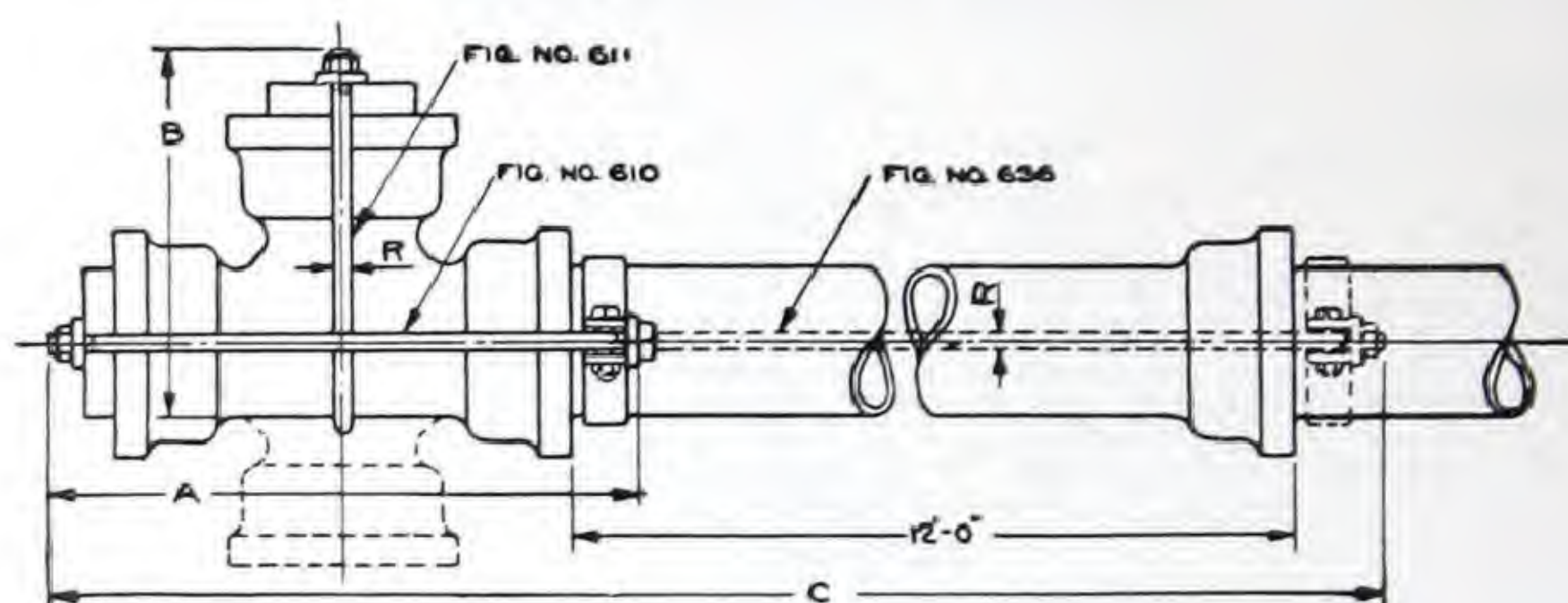


Socket $\frac{1}{8}$ Bend—Plug Clamp
Fig. No. 609

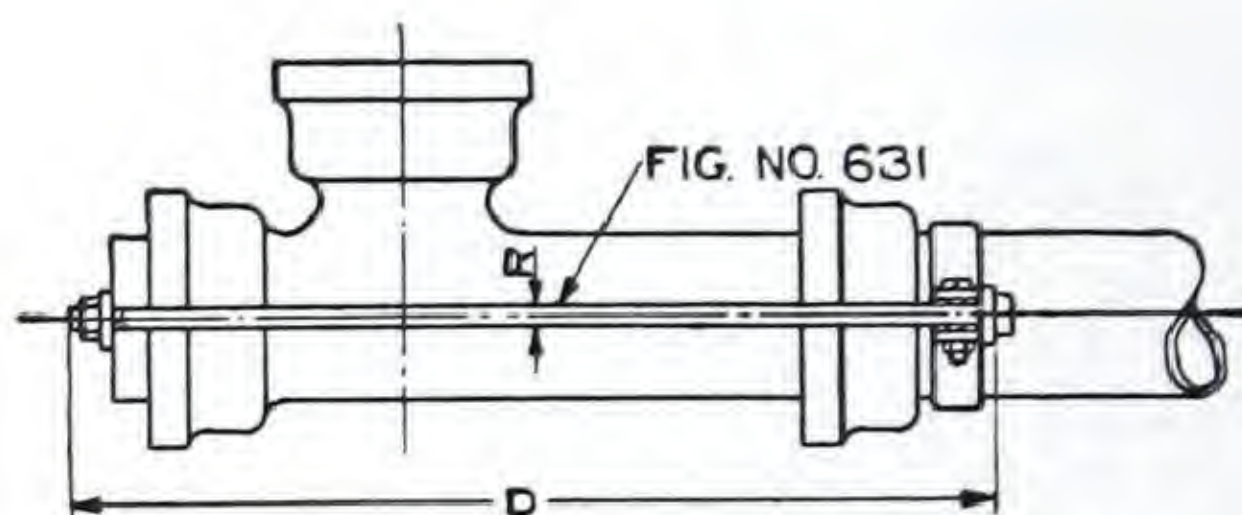
SIZE	LIST PRICES			DIMENSIONS						
	Fig. No. 607	Fig. No. 608	Fig. No. 609	A	B	C	D	E	F	R
4	1.60	.90	.90	1-1 $\frac{1}{2}$	1-2	1-2 $\frac{1}{2}$	1-0 $\frac{1}{8}$	2	$\frac{3}{4}$	$\frac{3}{4}$
6	1.70	1.00	1.00	1-1 $\frac{1}{2}$	1-3 $\frac{1}{2}$	1-4 $\frac{1}{2}$	1-2 $\frac{3}{8}$	2	$\frac{3}{4}$	$\frac{3}{4}$
8	1.85	1.20	1.20	1-1 $\frac{1}{2}$	1-5	1-6 $\frac{1}{2}$	1-4 $\frac{5}{8}$	2	$\frac{3}{4}$	$\frac{3}{4}$
10	2.25	1.40	1.40	1-1 $\frac{1}{2}$	1-6 $\frac{3}{4}$	1-9	1-6 $\frac{7}{8}$	2 $\frac{1}{2}$	$\frac{3}{4}$	$\frac{3}{4}$
12	2.50	1.80	1.80	1-1 $\frac{1}{2}$	1-8 $\frac{1}{2}$	1-11	1-9 $\frac{1}{4}$	2 $\frac{1}{2}$	$\frac{3}{4}$	$\frac{3}{4}$

Order by Figure Number.

LIST PRICES AND DIMENSIONS

Grinnell Socket Clamps

Socket Tee—Plug Clamps
Fig. Nos. 610, 611, 636



Socket Tee—Plug Clamp for Spigot End Tee
Fig. No. 631

SIZE	LIST PRICES				DIMENSIONS				
	Fig. No. 610	Fig. No. 611	Fig. No. 636	Fig. No. 631	A	B	C	D	R
4	1.70	.90	2.75	....	2-1	1-6	14-3	....	$\frac{3}{4}$
6	1.80	1.00	3.10	1.90	2-4	1-8 $\frac{1}{2}$	14-8	2-11	$\frac{3}{4}$
8	2.00	1.20	3.50	2.10	2-6 $\frac{1}{2}$	1-9	14-8	3-2	$\frac{3}{4}$
10	2.40	1.40	4.00	....	2-11	2-0	15-3	....	$\frac{3}{4}$
12	2.75	1.80	4.75	....	3-2	2-2	15-3	....	$\frac{3}{4}$

Above clamps are for straight size fittings. Clamps for reducing sizes furnished on order.

Order by Figure Number.

LIST PRICES AND DIMENSIONS

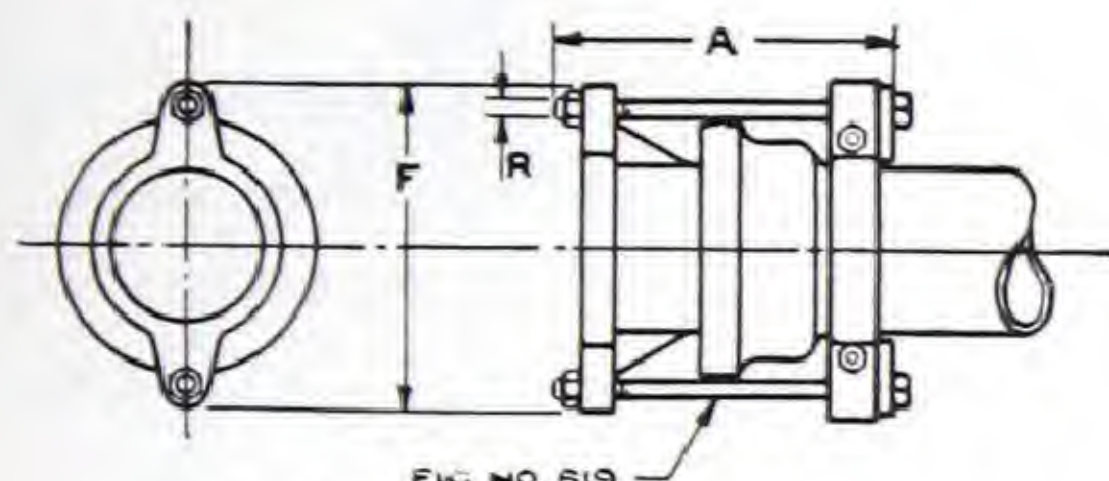
Grinnell Socket Clamps

FIG. NO. 619
Socket Pipe—Warren
Coupling Clamp
Fig. No. 619

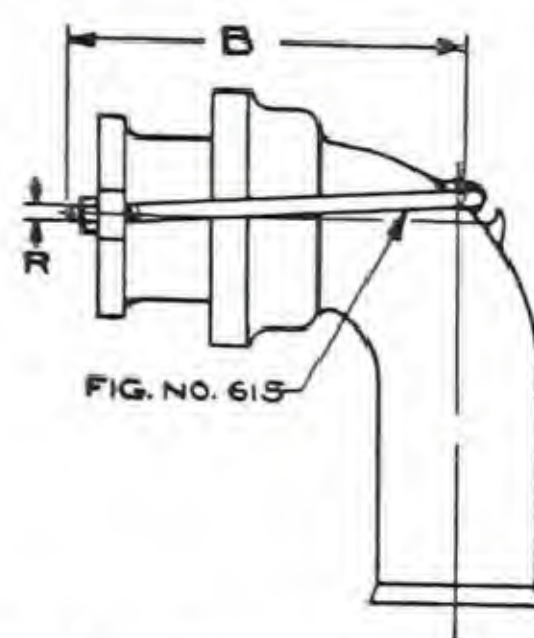


FIG. NO. 615
Socket $\frac{1}{4}$ Bend—Warren
Coupling Clamp
Fig. No. 615

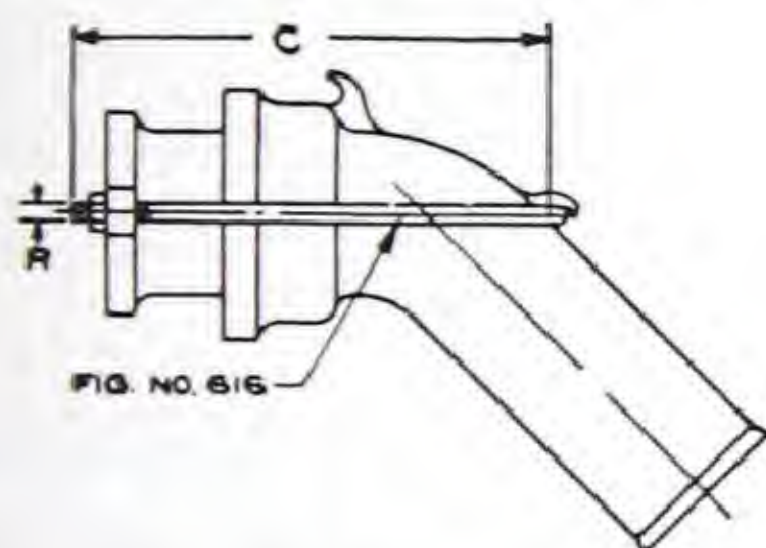


FIG. NO. 616
Socket $\frac{1}{8}$ Bend—Warren
Coupling Clamp
Fig. No. 616

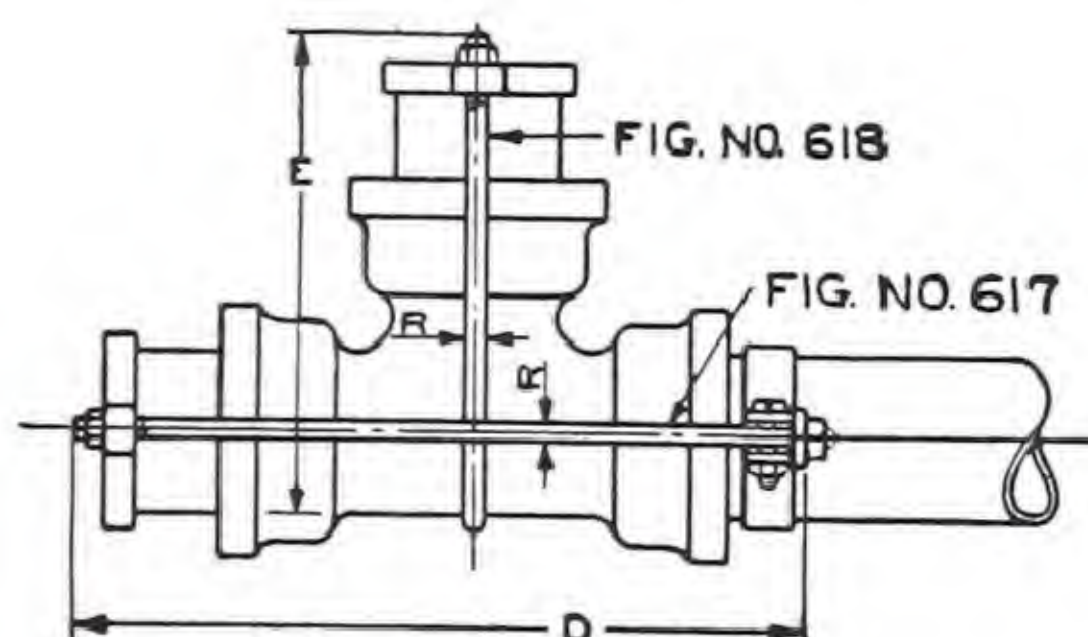


FIG. NO. 618
FIG. NO. 617
Socket Tee—Warren
Coupling Clamps
Fig. Nos. 617, 618

Note:—Clamps are the same for both straight and reducing sizes of Warren Couplings.

SIZE	LIST PRICES					DIMENSIONS						
	Fig. No. 619	Fig. No. 615	Fig. No. 616	Fig. No. 617	Fig. No. 618	A	B	C	D	E	F	R
4	1.10	.35	.35	1.30	.35	1-4	1-4	1-5	2-4	1-6	0-11 $\frac{3}{4}$	$\frac{3}{4}$
6	1.30	.45	.45	1.50	.45	1-4	1-5 $\frac{3}{4}$	1-7	2-6 $\frac{1}{2}$	1-8 $\frac{1}{2}$	1-2	$\frac{3}{4}$

Above Clamps are for straight size fittings. Clamps for reducing sizes furnished on order.

Order by Figure Number.

GRINNELL ADJUSTABLE PIPE HANGERS AND SUPPORTS

On the following pages are shown the general line of Grinnell Adjustable Pipe Hangers and Supports. This line of hangers is the outgrowth of more than seventy years' experience in industrial piping and is designed to meet practically every condition and circumstance of pipe installation work.

Grinnell Hangers are adjustable, practical and adaptable, which means low installation costs and permanently satisfactory work. Every user of these hangers knows that they produce "Better jobs with less labor."

In the hanger section of this catalogue which follows, this line of hangers is described briefly by text and illustration. Mechanical drawings and dimension tables on practically every item provide the engineering data necessary to a proper determination of types and sizes.

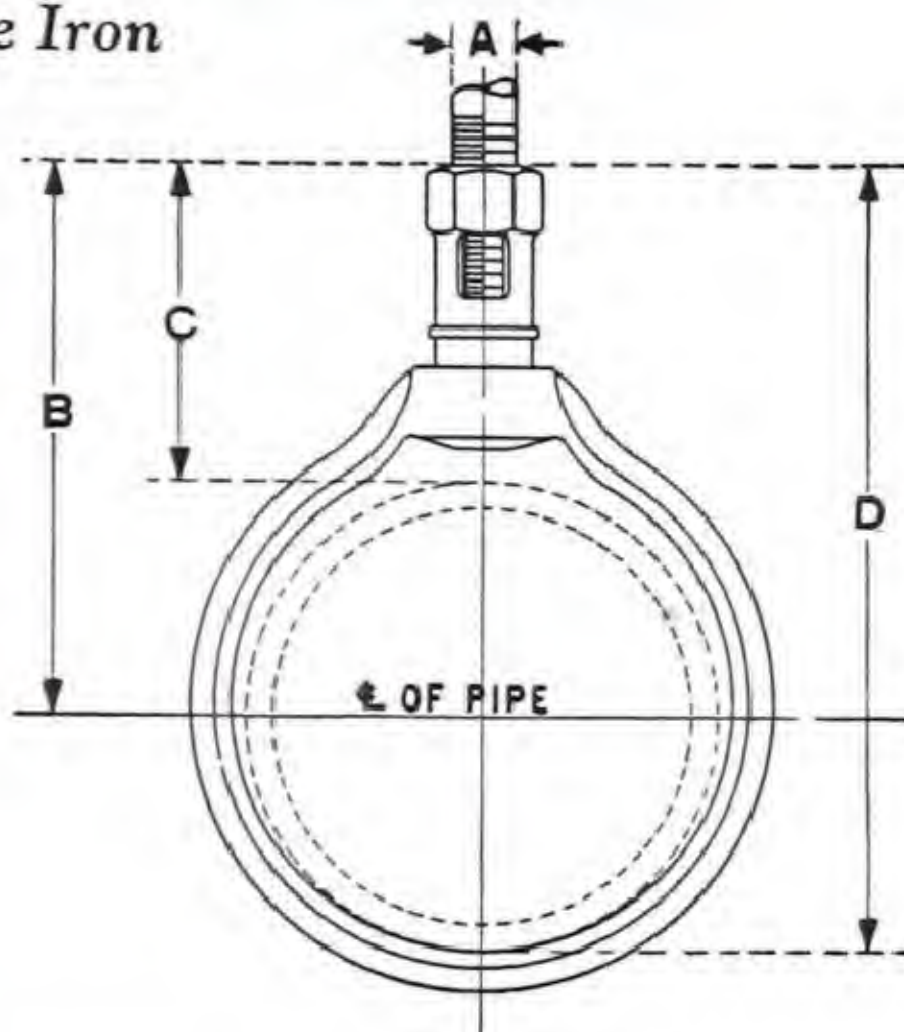
It will be noted that Grinnell hanger parts are in most cases interchangeable; this feature provides for their installation under varying conditions. When, however, some detail of construction or piping arrangement makes it necessary to deviate from standard type hangers, Grinnell Company with its unrivalled manufacturing facilities is equipped to furnish hangers and supports of any desired type and are always pleased to co-operate with Engineers and Architects in the preparation of specifications covering their hanger requirements.

It is not economically possible to carry all types of hangers in stock. A large stock of such types and sizes which are in regular demand is carried, and the range is being added to and varied to meet current requirements. Hangers not in stock can be furnished within a reasonable time after receipt of covering specifications and orders.

HANGERS

Grinnell Adjustable Swivel Rings

Malleable Iron



Adjustable Swivel Ring—Fig. No. 101

LIST PRICES AND DIMENSIONS

Pipe Size Inches	Price Each	A	B	C	D
$\frac{3}{4}$	.18	$\frac{3}{8}$	$2\frac{1}{2}$	2	$3\frac{1}{8}$
1	.20	$\frac{3}{8}$	$2\frac{3}{4}$	2	$3\frac{3}{8}$
$1\frac{1}{4}$	.21	$\frac{3}{8}$	$2\frac{7}{8}$	$2\frac{1}{8}$	$3\frac{3}{4}$
$1\frac{1}{2}$	.22	$\frac{3}{8}$	3	$2\frac{1}{8}$	4
2	.24	$\frac{3}{8}$	$3\frac{1}{4}$	$2\frac{1}{8}$	$4\frac{1}{2}$
$2\frac{1}{2}$	.34	$\frac{1}{2}$	$3\frac{3}{4}$	$2\frac{3}{8}$	$5\frac{1}{4}$
3	.42	$\frac{1}{2}$	$4\frac{1}{8}$	$2\frac{3}{8}$	$5\frac{7}{8}$
$3\frac{1}{2}$	.44	$\frac{1}{2}$	$4\frac{3}{8}$	$2\frac{3}{8}$	$6\frac{3}{8}$
4	.56	$\frac{5}{8}$	$5\frac{3}{8}$	$3\frac{1}{8}$	$7\frac{5}{8}$
$4\frac{1}{2}$	.62	$\frac{5}{8}$	$5\frac{1}{2}$	$2\frac{7}{8}$	$7\frac{7}{8}$
5	.70	$\frac{5}{8}$	$5\frac{3}{4}$	3	$8\frac{1}{2}$
6	1.08	$\frac{3}{4}$	7	$3\frac{3}{4}$	$10\frac{3}{8}$
7	1.75	$\frac{3}{4}$	$7\frac{3}{4}$	4	$11\frac{5}{8}$
8	1.92	$\frac{7}{8}$	$8\frac{7}{8}$	$4\frac{1}{2}$	$13\frac{1}{4}$

The Adjustable Swivel Ring can be used with Coach Screw Rod or with Machine Threaded Rod in connection with practically any type of Ceiling Flange, Expansion Case, Insert, etc.

The unusual feature of this ring is the Swivel Shank allowing an adjustment of about two inches by simply turning the nut on the shank to the left or right. No temporary support of the pipe line is necessary while making adjustments.

Although the ring and shank are two separate pieces, they are cast as one unit. The swivel shank automatically locks when pipe is in desired position. This locking prevents loosening due to vibration and assures proper pitch of the Line at all times.

Order by Figure Number.

HANGERS

Grinnell Adjustable Coach Screw Clips
Grinnell Adjustable Swivel Ring Hangers

Malleable Iron



Adjustable Coach Screw Clip
Fig. No. 100



Adjustable Swivel Ring Hanger
Fig. No. 102

LIST PRICES AND DIMENSIONS—Fig. No. 100

Pipe Size Inches	Price Each	COACH SCREW ROD		Nominal Distances Ceiling to Center of Pipe
		Diameter	Length	
$\frac{3}{4}$	.28	$\frac{3}{8}$	$9\frac{3}{8}$	$6\frac{3}{4}$ — $7\frac{1}{8}$
1	.30	$\frac{3}{8}$	$10\frac{1}{8}$	$7\frac{5}{8}$
$1\frac{1}{4}$	.31	$\frac{3}{8}$	$10\frac{1}{2}$	$8\frac{1}{8}$
$1\frac{1}{2}$	.32	$\frac{3}{8}$	$10\frac{3}{4}$	$8\frac{5}{8}$ — $9\frac{1}{8}$
2	.34	$\frac{3}{8}$	$11\frac{1}{2}$	$9\frac{5}{8}$ — $10\frac{1}{8}$

LIST PRICES AND DIMENSIONS—Fig. No. 102

Pipe Size Inches	Price Each	Diameter of Rod	Length of Rod
$\frac{3}{4}$	.46	$\frac{3}{8}$	8
1	.48	$\frac{3}{8}$	8
$1\frac{1}{4}$	.50	$\frac{3}{8}$	8
$1\frac{1}{2}$	.52	$\frac{3}{8}$	8
2	.54	$\frac{3}{8}$	8

Fig. No. 100 is a combination of Adjustable Swivel Ring, Fig. No. 101, and Coach Screw Rod, Fig. No. 142. It is sold complete as illustrated for hanging $\frac{3}{4}$ -inch to 2-inch pipe inclusive. For other sizes of pipe, and other lengths of rods than specified in the table, order parts separately.

Fig. No. 102 is a combination of Adjustable Swivel Ring, Fig. No. 101, Machine Threaded Rod, Fig. No. 140, Spring Ceiling Plate, Fig. No. 133 and U. S. Expansion Case Fig. No. 117. It is sold complete as illustrated in sizes given in table. For rod lengths other than given in table, order parts separately.

Order by Figure Number.

HANGERS

*Grinnell Adjustable Coach Screw Clips (Short)**Malleable Iron*Adjustable Coach Screw Clip (Short)
Fig. No. 99

LIST PRICES AND DIMENSIONS—Fig. No. 99

Pipe Size Inches	Price Each	Diameter of Rod, Inches	Length of Rod, Inches
$\frac{3}{4}$	.28	$\frac{3}{8}$	5
1	.30	$\frac{3}{8}$	5
$1\frac{1}{4}$	.31	$\frac{3}{8}$	5
$1\frac{1}{2}$	.32	$\frac{3}{8}$	5
2	.34	$\frac{3}{8}$	5
$2\frac{1}{2}$	.47	$\frac{1}{2}$	6
3	.55	$\frac{1}{2}$	6
$3\frac{1}{2}$	.57	$\frac{1}{2}$	6
4	.73	$\frac{5}{8}$	6
$4\frac{1}{2}$	.79	$\frac{5}{8}$	6
5	.87	$\frac{5}{8}$	6
6	1.26	$\frac{3}{4}$	6
7	1.93	$\frac{3}{4}$	6
8	2.16	$\frac{7}{8}$	7

Fig. No. 99 is a combination of Adjustable Swivel Ring, Fig. No. 101, and Coach Screw Rod, Fig. No. 142. It is sold complete as illustrated with rod lengths given above. For other rod lengths than given in table, order parts separately.

Order by Figure Number.

HANGERS

*Grinnell Adjustable Swivel Rings
Split Ring Type*

Malleable Iron

Adjustable Swivel Ring
Split Ring Type—Fig. No. 104

LIST PRICES AND DIMENSIONS

Pipe Size	Price Each	Size of Rod	TOP OF NUT ON SHANK TO		
			Center of Pipe	Top of Pipe	Bottom of Pipe
2	.24	$\frac{3}{8}$	$3\frac{7}{16}$	$2\frac{1}{4}$	$4\frac{5}{8}$
$2\frac{1}{2}$	.34	$\frac{1}{2}$	$4\frac{1}{16}$	$2\frac{5}{8}$	$5\frac{1}{2}$
3	.42	$\frac{1}{2}$	$4\frac{3}{8}$	$2\frac{5}{8}$	$6\frac{1}{8}$
$3\frac{1}{2}$	.44	$\frac{1}{2}$	$4\frac{3}{4}$	$2\frac{3}{4}$	$6\frac{3}{4}$
4	.56	$\frac{5}{8}$	$5\frac{5}{8}$	$3\frac{3}{8}$	$7\frac{7}{8}$
5	.70	$\frac{5}{8}$	$6\frac{5}{16}$	$3\frac{1}{2}$	$9\frac{1}{8}$
6	1.08	$\frac{3}{4}$	$7\frac{9}{16}$	$4\frac{1}{4}$	$10\frac{7}{8}$

The Split Ring Type of Adjustable Swivel Ring shown above was designed for use with Coach Screw Rod or with Machine Threaded Rod in the same way as the Solid Ring Type shown on page 391. The Swivel Shank feature allows adjustment of about two inches. Note on this Ring that the closing of the hinged section of the Ring locks the Swivel Shank, as the extension of the hinged section fits into one of the recesses at the bottom of the Shank. This locking feature prevents loosening due to vibration in the pipe line.

The hinging of the Ring is somewhat off center. This provides sufficient seating to hold pipe securely while making all necessary adjustments before closing the Ring.

Order by Figure Number.

HANGERS

Grinnell Adjustable Clips

Malleable Iron



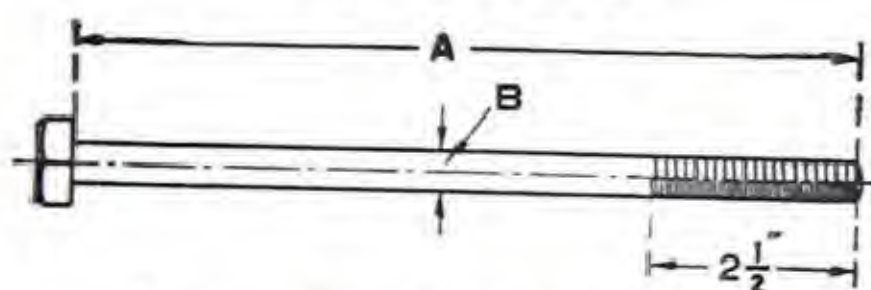
Adjustable Clip
Fig. No. 106



Adjustable Clip Base
Fig. No. 116



Adjustable Clip Ring
Fig. No. 105



Square Head Hanger Rod
Fig. No. 144 (Threaded)

LIST PRICES AND DIMENSIONS

Pipe Size	Fig. No. 106 Each	Fig. No. 116 Each	Fig. No. 105 Each	Fig. No. 144 Each	Square Head Hanger Rod		Nominal Distance Ceiling to Center of Pipe	Length of Shank	Inside Diam- eter of Ring
					A	B			
$\frac{3}{4}$	\$.18	\$.10	\$.10	\$.05	$5\frac{1}{4}$	$\frac{3}{8}$	$6\frac{3}{4}$ - $7\frac{1}{8}$	2	$1\frac{3}{16}$
1	.20	.10	$11\frac{1}{2}$	.05	$5\frac{1}{4}$	$\frac{3}{8}$	$7\frac{5}{8}$	2	$1\frac{7}{16}$
$1\frac{1}{4}$	.22	.10	$12\frac{1}{2}$	.05	$5\frac{3}{4}$	$\frac{3}{8}$	$8\frac{1}{8}$	2	$1\frac{13}{16}$
$1\frac{1}{2}$	.25	.10	.16	.05	$6\frac{1}{8}$	$\frac{3}{8}$	$8\frac{5}{8}$ - $9\frac{1}{8}$	2	$2\frac{1}{16}$
2	.28	.10	.20	.05	7	$\frac{3}{8}$	$9\frac{5}{8}$ - $10\frac{1}{8}$	2	$2\frac{9}{16}$

The Adjustable Clip Ring allows about $1\frac{1}{2}$ -inch adjustment, which adjustment can easily be made after pipe is installed by raising pipe until head of rod is close to ceiling and turning rod.

This hanger is made in sizes $\frac{3}{4}$ to 2-inch only. Rods are regularly furnished with a $2\frac{1}{2}$ -inch machine thread.

Two holes for No. 18 screws in each base.

When other lengths of Square Head Hanger Rod than given in table are wanted, order parts separately.

Order by Figure Number.

HANGERS

Grinnell Split Pipe Rings

Malleable Iron



Split Pipe Ring
Fig. No. 108



Split Pipe Ring With Socket
Pipe Thread—Fig. No. 107
Rod Thread—Fig. No. 107-R



Socket for Split Pipe Ring
Pipe Thread—Fig. No. 110
Rod Thread—Fig. No. 110-R

LIST PRICES

Pipe Size Inches	RING ONLY	RING AND SOCKET		SOCKET ONLY		SOCKET TAPPED	
	Fig. No. 108	Pipe Thread Fig. No. 107	Rod Thread Fig. No. 107-R	Pipe Thread Fig. No. 110	Rod Thread Fig. No. 110-R	Pipe Thread Size Inches	Rod Thread Size Inches
1/2	.08	.10	.10	.08	.08	1/8	3/8
3/4	.10	.12	.12	.08	.08	1/8	3/8
1	.10	.12	.12	.08	.08	1/8	3/8
1 1/4	.12	.14	.14	.10	.08	1/4	3/8
1 1/2	.14	.16	.16	.10	.08	1/4	3/8
2	.16	.18	.18	.10	.08	1/4	3/8
2 1/2	.20	.22	.22	.10	.10	1/4	1/2
3	.25	.28	.28	.10	.10	1/4	1/2
3 1/2	.40	.43	.43	.12	.10	3/8	1/2
4	.50	.53	.53	.12	.12	3/8	5/8
4 1/2	.55	.58	.58	.12	.12	3/8	5/8
5	.60	.63	.63	.15	.12	1/2	5/8
6	.80	.82	.82	.15	.15	1/2	3/4
7	1.10	1.12	1.12	.15	.15	1/2	3/4
8	1.30	1.32	1.32	.15	.15	1/2	7/8

Socket Fig. No. 110 is furnished tapped for pipe thread as given in the table. Socket Fig. No. 110-R is furnished tapped for rod thread as given in table. These sockets are used in connection with Fig. No. 108 Split Pipe Ring and Fig. No. 131 I Beam Clamp.

Order by Figure Number.



HANGERS

Grinnell Split Rings

Malleable Iron



Split Ring with Socket
and Ceiling Flange Pipe Threaded
Fig. No. 127

Split Ring with Socket and
Pipe Thr'd Coach Screw—Fig. No. 109
Rod Thr'd Coach Screw—Fig. No. 109-R

LIST PRICES AND DIMENSIONS

Pipe Size Inches	LIST PRICES		Fig. No. 127 Tapped Pipe Size Inches	FIG. NO. 109		FIG. NO. 109-R	
	Fig. No. 127 Each	Fig. Nos. 109 109-R Each		Pipe Thread Size Inches	Length of Coach Screw Inches	Rod Size Inches	Length of Rod Inches
$\frac{1}{2}$	.15	.15	$\frac{1}{8}$	$\frac{1}{8}$	$3\frac{1}{2}$	$\frac{3}{8}$	$3\frac{1}{2}$
$\frac{3}{4}$	.18	.18	$\frac{1}{8}$	$\frac{1}{8}$	$3\frac{1}{2}$	$\frac{3}{8}$	$3\frac{1}{2}$
1	.18	.18	$\frac{1}{8}$	$\frac{1}{8}$	$3\frac{1}{2}$	$\frac{3}{8}$	$3\frac{1}{2}$
$1\frac{1}{4}$	.20	.20	$\frac{1}{4}$	$\frac{1}{4}$	$3\frac{1}{2}$	$\frac{3}{8}$	$3\frac{1}{2}$
$1\frac{1}{2}$	.22	.22	$\frac{1}{4}$	$\frac{1}{4}$	$3\frac{1}{2}$	$\frac{3}{8}$	$3\frac{1}{2}$
2	.25	.25	$\frac{1}{4}$	$\frac{1}{4}$	$3\frac{1}{2}$	$\frac{3}{8}$	$3\frac{1}{2}$
$2\frac{1}{2}$	.30	.30	$\frac{1}{4}$	$\frac{1}{4}$	$3\frac{1}{2}$	$\frac{1}{2}$	$3\frac{1}{2}$
3	.35	.35	$\frac{1}{4}$	$\frac{1}{4}$	$3\frac{1}{2}$	$\frac{1}{2}$	$3\frac{1}{2}$
$3\frac{1}{2}$	.50	.50	$\frac{3}{8}$	$\frac{3}{8}$	5	$\frac{1}{2}$	$3\frac{1}{2}$
4	.60	.60	$\frac{3}{8}$	$\frac{3}{8}$	5	$\frac{5}{8}$	5
$4\frac{1}{2}$	.65	.65	$\frac{3}{8}$	$\frac{3}{8}$	5	$\frac{5}{8}$	5
5	.70	.70	$\frac{1}{2}$	$\frac{1}{2}$	5	$\frac{5}{8}$	5
6	.90	.90	$\frac{1}{2}$	$\frac{1}{2}$	5	$\frac{3}{4}$	5
7	1.20	1.20	$\frac{1}{2}$	$\frac{1}{2}$	5	$\frac{3}{4}$	5
8	1.40	1.40	$\frac{1}{2}$	$\frac{1}{2}$	5	$\frac{7}{8}$	5

Fig. No. 127 is a combination of Split Pipe Ring with Socket, Fig. No. 107 and Ceiling Flange, Fig. No. 128. The nipple is not included in above list prices.

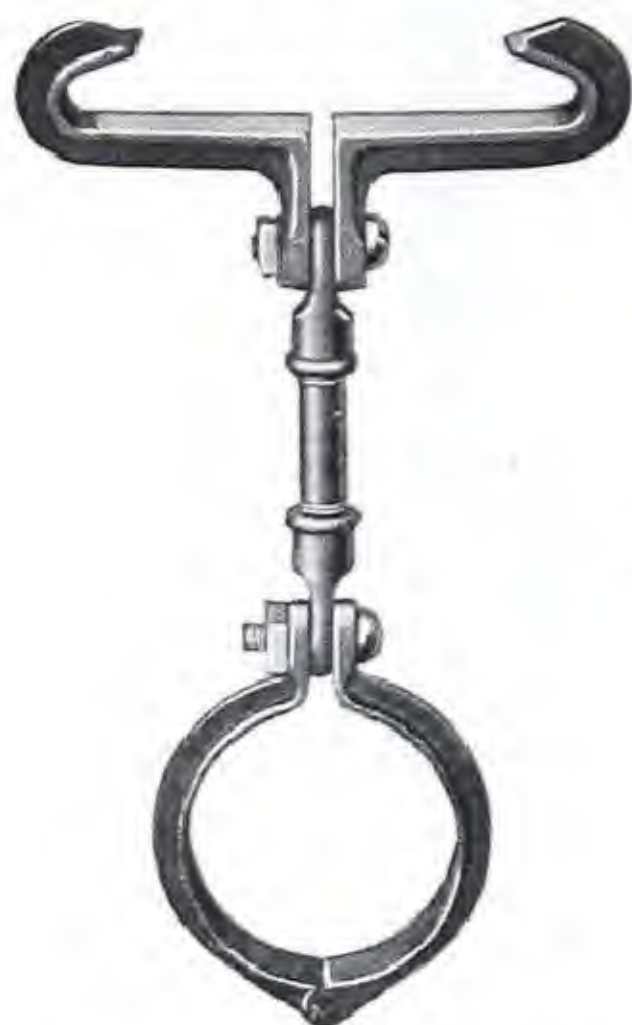
Fig. No. 109 is a combination of Split Pipe Ring, Fig. No. 107 and Pipe Threaded Coach Screw, Fig. No. 111.

Fig. No. 109-R is a combination of Split Pipe Ring with socket and Machine Threaded Coach Screw Rod, Fig. No. 142.

Order by Figure Number.

HANGERS

Grinnell Split Rings and I Beam Clamps
Malleable Iron



I Beam Hanger
Pipe Threaded—Fig. No. 132
Rod Threaded—Fig. No. 132-R



I Beam Clamp
Fig. No. 131

LIST PRICES

Pipe Size Inches	Fig. Nos. 132, 132-R Each	Fig. No. 132 Tapped For Pipe Size—Inches	Fig. No. 132-R Tapped for Rod Size—Inches
$\frac{1}{2}$	.55	$\frac{1}{8}$	$\frac{3}{8}$
$\frac{3}{4}$	.55	$\frac{1}{8}$	$\frac{3}{8}$
1	.58	$\frac{1}{8}$	$\frac{3}{8}$
$1\frac{1}{4}$	.60	$\frac{1}{4}$	$\frac{3}{8}$
$1\frac{1}{2}$	.62	$\frac{1}{4}$	$\frac{3}{8}$
2	.65	$\frac{1}{4}$	$\frac{3}{8}$
$2\frac{1}{2}$	.70	$\frac{1}{4}$	$\frac{1}{2}$
3	.75	$\frac{1}{4}$	$\frac{1}{2}$
$3\frac{1}{2}$	.90	$\frac{3}{8}$	$\frac{1}{2}$
4	1.00	$\frac{3}{8}$	$\frac{5}{8}$
$4\frac{1}{2}$	1.05	$\frac{3}{8}$	$\frac{5}{8}$
5	1.10	$\frac{1}{2}$	$\frac{5}{8}$
6	1.30	$\frac{1}{2}$	$\frac{3}{4}$

LIST PRICES—Fig. No. 131

I Beam Flange..... Width	2"	$2\frac{1}{2}$ "	3"	$3\frac{1}{2}$ "	4"	$4\frac{1}{2}$ "	5"	$5\frac{1}{2}$ "	6"
Price..... Each	.40	.40	.40	.40	.40	.40	.40	.40	.40

Fig. Nos. 132, 132-R are combinations of I Beam Clamp, Fig. No. 131, Split Pipe Ring, Fig. No. 108, and Sockets, Fig. Nos. 110 or 110-R. Fig. No. 132 is used with pipe nipple, Fig. No. 132-R is used with a threaded rod. The nipple or rod is not included in above list prices, but must be ordered separately.

When ordering Fig. Nos. 131, 132 or 132-R specify width of I Beam and space between halves of clamp.

Order by Figure Number.

HANGERS

Grinnell Split Ring Hangers



Extension Split Ring
Fig. No. 138



Extension Split Ring with
Ceiling Flange and Nipple
Fig. No. 139



Ceiling Flange
Malleable
Fig. No. 128

Without Nipple—Fig. No. 139-A

LIST PRICES—Fig. Nos. 138, 139, 139-A

Pipe Size	Tapped For Pipe Size	Fig. No. 138 Plain	Fig. No. 138 Galvanized	Fig. No. 139 Plain Complete	Fig. No. 139 Galvanized Complete	Fig. No. 139-A Plain Without Nipple	Fig. No. 139-A Galvanized Without Nipple
Inches	Inches	Each	Each	Each	Each		
$\frac{3}{8}$	$\frac{1}{4}$	.15	.17	.22	.25	.17	.20
$\frac{1}{2}$	$\frac{1}{4}$	.15	.17	.22	.25	.17	.20
$\frac{3}{4}$	$\frac{1}{4}$	.18	.20	.27	.30	.22	.25
1	$\frac{1}{4}$	.22	.25	.32	.35	.27	.30
$1\frac{1}{4}$	$\frac{1}{4}$	.27	.30	.35	.40	.30	.35
$1\frac{1}{2}$	$\frac{1}{4}$	.35	.40	.40	.50	.35	.45
2	$\frac{1}{4}$	.40	.50	.50	.60	.45	.55
$2\frac{1}{2}$	$\frac{1}{2}$	.45	.60	.70	.80	.65	.70
3	$\frac{1}{2}$	.50	.65	.90	1.00	.80	.90
4	$\frac{1}{2}$	.65	.80	1.10	1.25	1.00	1.15
5	$\frac{3}{4}$	1.00	1.50	1.40	1.75	1.30	1.65
6	$\frac{3}{4}$	1.50	2.00	1.90	2.25	1.80	2.15

LIST PRICES—Fig. No. 128

Flange Number	Tapped for Pipe Size	SCREWS		Price Plain	Price Galvanized
		Quantity	Size Number		
0	$\frac{1}{8}$	2	12	.10	.15
1	$\frac{1}{4}$	2	12	.10	.15
2	$\frac{3}{8}$	2	14	.15	.20
3	$\frac{1}{2}$	4	18	.20	.25
4	$\frac{3}{4}$	4	18	.22	.28

Fig. No. 139 is a combination of Fig. Nos. 138 and 128 and is furnished with a 4-inch nipple. When longer than 4-inch nipple is wanted, order parts separately.

Order by Figure Number.

HANGERS

*Grinnell Pipe—Swivel—and Swinging
Hanger Flanges
Cast Iron*



Pipe Hanger Flange
Fig. No. 153



Swivel Hanger Flange
Fig. No. 154



Swinging Hanger Flange
Fig. No. 158

LIST PRICES

Flange No.	Pipe Size Inches	Fig. No. 153 Each	Fig. No. 154 Each	Fig. No. 158 Each
1	$\frac{3}{4}$ -1-1 $\frac{1}{4}$ -1 $\frac{1}{2}$ -2	.08	.14	.08
2	2 $\frac{1}{2}$ -3-3 $\frac{1}{2}$	.15	.22	.17
3	4-4 $\frac{1}{2}$ -5	.30	.40	.36
4	6-7	.36	.57	.57
5	8-9-10-12	.60	.85	.80

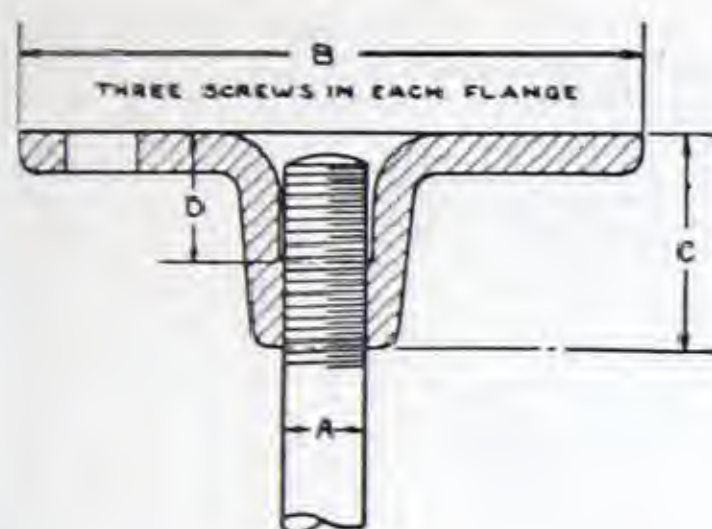
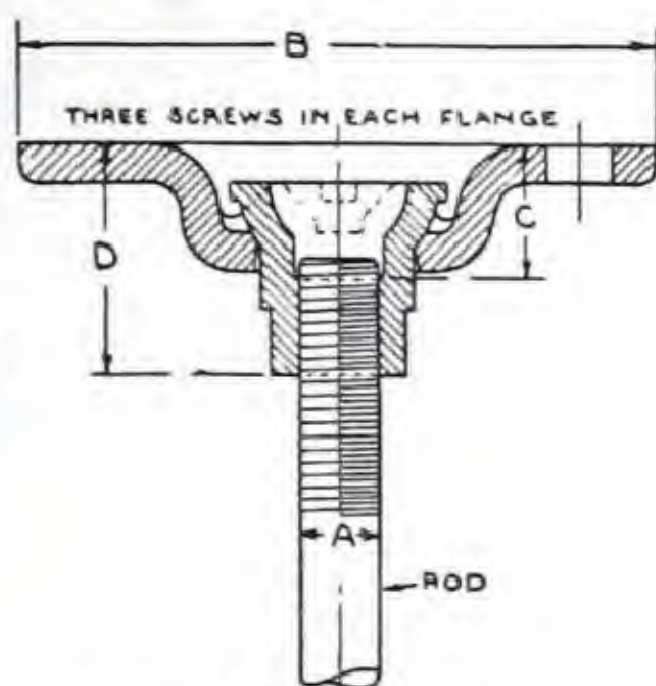
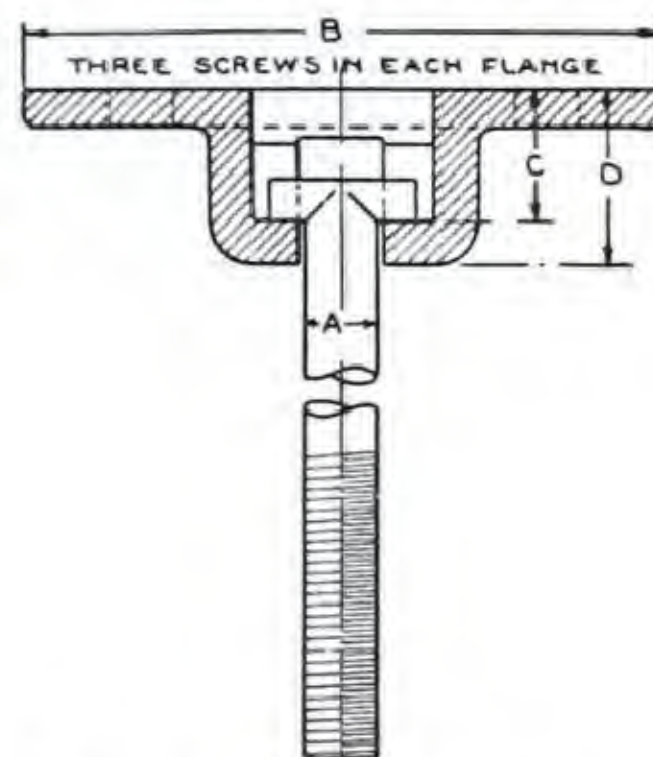
Fig. No. 153 is designed primarily for use on level ceilings and provides an adjustment of 1-inch where rod enters flange.

Fig. No. 154 is a semi-swinging type hanger flange providing for a ceiling angle not greater than five degrees off level in any direction.

Fig. No. 158 is a full swinging type hanger flange through 180 degrees. This type is used only with special T headed swinging hanger flange rods, Fig. Nos. 146, 147.

Order by Figure Number.

HANGERS

Grinnell Pipe—Swivel—and Swinging Hanger Flanges
Cast IronPipe Hanger Flange
Fig. No. 153Swivel Hanger Flange
Fig. No. 154Swinging Hanger Flange
Fig. No. 158

DIMENSIONS—Fig. No. 153

Flange No.	Pipe Size Inches	A	B	C	D	Size Screws
1	$\frac{3}{4}$ -1-1 $\frac{1}{4}$ -1 $\frac{1}{2}$ -2	$\frac{3}{8}$	2 $\frac{7}{8}$	1 $\frac{3}{8}$	$\frac{7}{8}$	1 $\frac{1}{2}$ No. 18
2	2 $\frac{1}{2}$ -3-3 $\frac{1}{2}$	$\frac{1}{2}$	4	1 $\frac{1}{2}$	$\frac{15}{16}$	Wood $\frac{3}{8}$ x 2
3	4-4 $\frac{1}{2}$ -5	$\frac{5}{8}$	4 $\frac{3}{4}$	1 $\frac{5}{8}$	1	Coach $\frac{1}{2}$ x 2
4	6-7	$\frac{3}{4}$	5 $\frac{1}{4}$	1 $\frac{7}{8}$	1 $\frac{1}{16}$	Coach $\frac{9}{16}$ x 2
5	8-9-10-12	$\frac{7}{8}$	6	2 $\frac{1}{8}$	1 $\frac{1}{8}$	Coach $\frac{5}{8}$ x 2

DIMENSIONS—Fig. No. 154

Flange No.	Pipe Size Inches	A	B	C	D	Size Inches
1	$\frac{3}{4}$ -1-1 $\frac{1}{4}$ -1 $\frac{1}{2}$ -2	$\frac{3}{8}$	3 $\frac{1}{4}$	$\frac{7}{8}$	1 $\frac{3}{8}$	1 $\frac{1}{2}$ No. 18
2	2 $\frac{1}{2}$ -3-3 $\frac{1}{2}$	$\frac{1}{2}$	4 $\frac{1}{8}$	$\frac{7}{8}$	1 $\frac{1}{2}$	Wood $\frac{3}{8}$ x 2
3	4-4 $\frac{1}{2}$ -5	$\frac{5}{8}$	5 $\frac{1}{4}$	$\frac{7}{8}$	1 $\frac{5}{8}$	Coach $\frac{1}{2}$ x 2
4	6-7	$\frac{3}{4}$	5 $\frac{7}{8}$	1	1 $\frac{7}{8}$	Coach $\frac{9}{16}$ x 2
5	8-9-10-12	$\frac{7}{8}$	6 $\frac{1}{2}$	1 $\frac{1}{8}$	2 $\frac{1}{8}$	Coach $\frac{5}{8}$ x 2

DIMENSIONS—Fig. No. 158

Flange No.	Pipe Size Inches	A	B	C	D	Size Screws
1	$\frac{3}{4}$ -1-1 $\frac{1}{4}$ -1 $\frac{1}{2}$ -2	$\frac{3}{8}$	3	$\frac{11}{16}$	$\frac{15}{16}$	1 $\frac{1}{2}$ No. 18
2	2 $\frac{1}{2}$ -3-3 $\frac{1}{2}$	$\frac{1}{2}$	4 $\frac{1}{4}$	$\frac{7}{8}$	1 $\frac{3}{16}$	Wood $\frac{3}{8}$ x 2
3	4-4 $\frac{1}{2}$ -5	$\frac{5}{8}$	5 $\frac{1}{8}$	1 $\frac{1}{16}$	1 $\frac{7}{16}$	Coach $\frac{1}{2}$ x 2
4	6-7	$\frac{3}{4}$	6	1 $\frac{1}{4}$	1 $\frac{11}{16}$	Coach $\frac{9}{16}$ x 2
5	8-9-10-12	$\frac{7}{8}$	6 $\frac{1}{2}$	1 $\frac{7}{16}$	1 $\frac{15}{16}$	Coach $\frac{5}{8}$ x 2

Order by Figure Number.

HANGERS

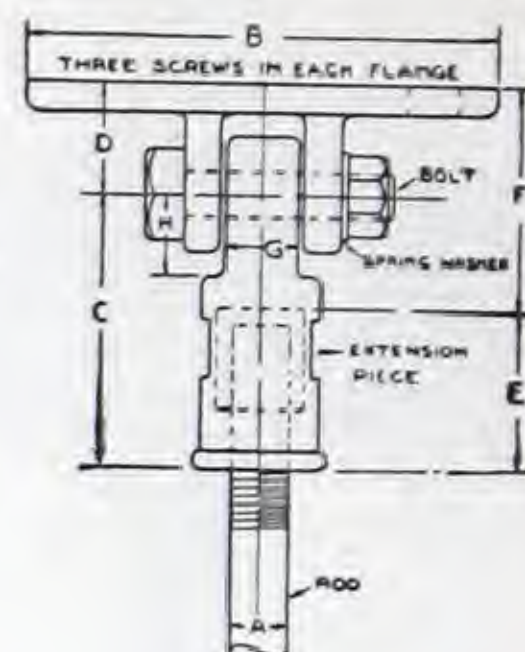
Grinnell Adjustable Swinging Hanger Flanges
Malleable IronAdjustable Swinging
Hanger Flange, Complete
Fig. No. 155

Fig. No. 155

Flange with Bolt, Nut
and Spring Washer
Fig. No. 156Extension Piece
only
Fig. No. 157

LIST PRICES

Size Number	Price Fig. No. 155 Each	Price Fig. No. 156 Each	Price Fig. No. 157 Each
1	.22	.16	.06
2	.37	.28	.09
3	.55	.42	.13
4	.68	.50	.18
5	1.00	.80	.20

DIMENSIONS

Flange No.	Pipe Size	A	B	C	D	E	F	G	H	Size Screws	Bolt
1	3/4-2	3/8	2 7/8	2 3/2	2 5/2	1 1/4	1 5/8	1/2	9/16	1 1/2 x 18	3/8 x 1 1/2
2	2 1/2-3 1/2	1/2	4	2 11/2	3 1/2	1 3/8	1 15/16	5/8	11/16	Wood	3/8 x 1 3/4
3	4-5	5/8	4 3/4	2 17/2	1 5/2	1 9/16	2 1/8	5/8	11/16	Coach	3/16 x 2
4	6-7	3/4	5 1/4	2 37/2	1 11/2	1 3/4	2 7/16	5/8	13/16	Coach	7/16 x 2 1/8
5	8-12	7/8	6	3 1/2	1 15/2	1 7/8	2 5/8	3/4	7/8	Coach	1/2 x 2 3/8

Fig. No. 155 Adjustable Swinging Hanger Flange is a combination of Fig. Nos. 156, 157 and will swing through a radius of 180 degrees. This type provides for a 1-inch adjustment of the rod.

Order by Figure Number.

HANGERS

Grinnell Screw and Adjustable Inserts

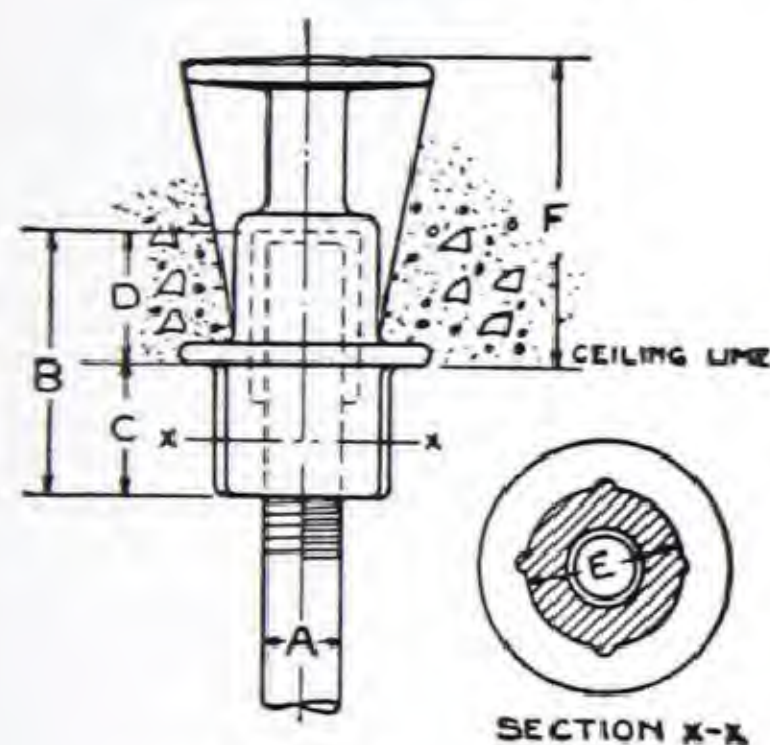
Cast Iron



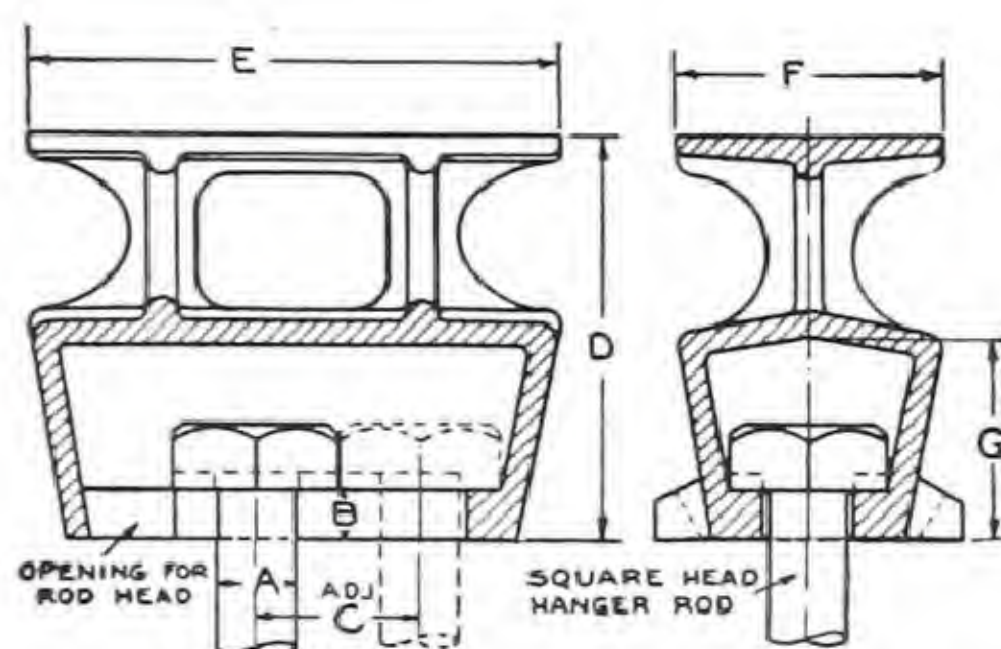
Screw Insert
Fig. No. 151



Adjustable Insert
Fig. No. 152



Screw Insert
Fig. No. 151



Adjustable Insert
Fig. No. 152

LIST PRICES AND DIMENSIONS—Fig. No. 151

Insert No.	Pipe Size Inches	Price Each	A	B	C	D	E	F
1	3/4-2	.08	3/8	1 1/2	7/8	5/8	7/8	2
2	2 1/2-3 1/2	.08	1/2	1 3/4	7/8	7/8	1	2
3	4-5	.14	5/8	1 7/8	7/8	1	1 1/8	2
4	6-7	.18	3/4	2 1/4	7/8	1 3/8	1 9/16	2 1/2
5	8-12	.24	7/8	2 1/4	7/8	1 3/8	1 9/16	2 1/2

LIST PRICES AND DIMENSIONS—Fig. No. 152

Insert No.	Pipe Size Inches	Price Each	A	B	C	D	E	F	G
1	3/4-2	.20	3/8	3/2	1	2 3/8	2 13/16	1 1/2	1 1/8
2	2 1/2-3 1/2	.30	1/2	5/16	1 1/16	2 5/8	3 7/16	1 3/4	1 1/4
3	4-5	.40	5/8	3/8	1 1/8	2 7/8	3 3/4	2 3/16	1 3/8
4	6-7	.60	3/4	7/16	1 1/8	3 1/4	4 1/8	2 1/2	1 5/8
5	8-12	.80	7/8	1/2	1 5/8	4	5 1/4	3 1/8	1 7/8

Fig. No. 151 Screw Insert is for use where lateral adjustment is not required. It is installed by drilling hole in form (see dimension E for size hole). It is locked in form by means of a short bolt and washer which prevents displacement during pouring of concrete.

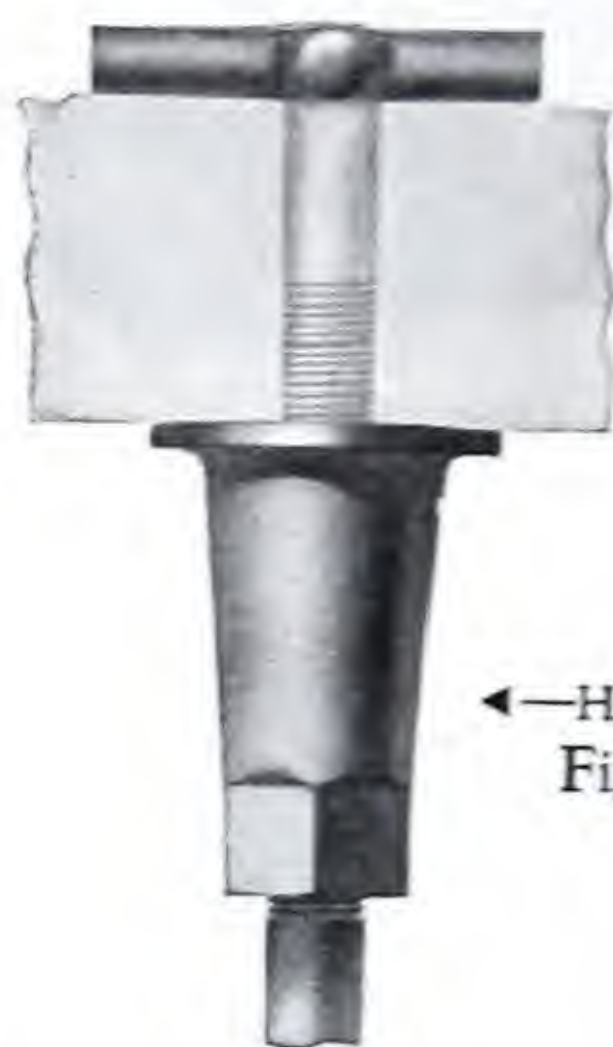
Fig. No. 152 Adjustable Insert provides lateral adjustment (see dimension C). Two lugs have been provided on each side for nailing insert in place.

Order by Figure Number.

HANGERS

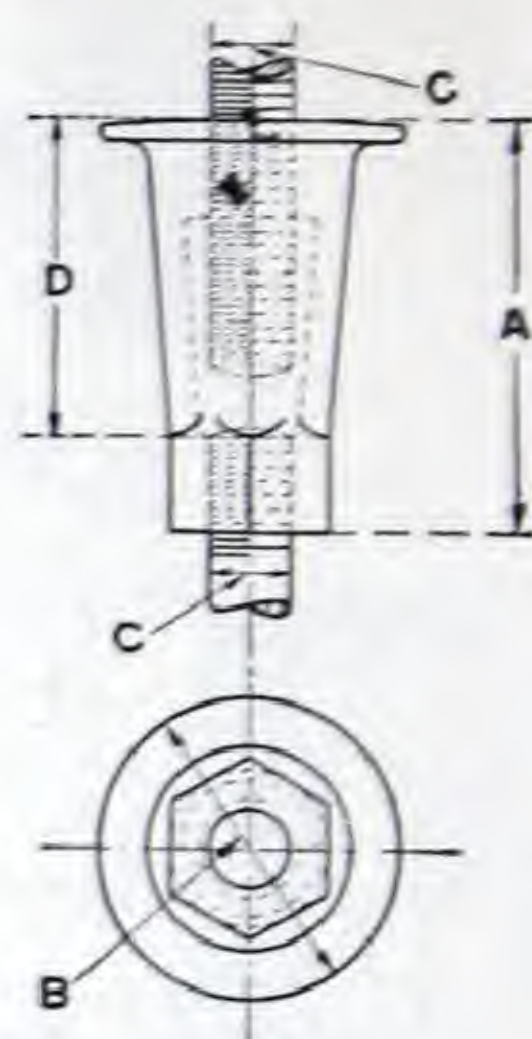
Grinnell Hanger Rod Couplings

Cast Iron



← Toggle Bolt
Fig. No. 209

← Hanger Rod Coupling
Fig. No. 208



LIST PRICES—HANGER ROD COUPLING ONLY—Fig. No. 208

Coupling Number	Pipe Size Inches	Price Each	A	B	C	D
1	$\frac{3}{4}$ -2	.13	$2\frac{1}{2}$	2	$\frac{3}{8}$	2
2	$2\frac{1}{2}$ - $3\frac{1}{2}$	.15	$2\frac{3}{4}$	$2\frac{1}{4}$	$\frac{1}{2}$	$2\frac{1}{8}$
3	4-5	.28	$3\frac{1}{4}$	$2\frac{1}{2}$	$\frac{5}{8}$	$2\frac{1}{2}$
4	6-7	.40	$3\frac{3}{4}$	$2\frac{7}{8}$	$\frac{3}{4}$	$2\frac{7}{8}$
5	8-12	.50	$4\frac{1}{4}$	$3\frac{1}{8}$	$\frac{7}{8}$	$3\frac{1}{4}$

LIST PRICES—TOGGLE BOLT ONLY—Fig. No. 209

Pipe Size Inches	Price Each	Size of Toggle Bolt	Length of Thread on Toggle Bolt	Length of Toggle Bolt
$\frac{3}{4}$ -2	.20	$\frac{3}{8}$	$2\frac{1}{2}$	6
$\frac{3}{4}$ -2	.28	$\frac{3}{8}$	$2\frac{1}{2}$	9
$\frac{3}{4}$ -2	.33	$\frac{3}{8}$	$2\frac{1}{2}$	12
$\frac{3}{4}$ -2	.40	$\frac{3}{8}$	$2\frac{1}{2}$	15
$\frac{3}{4}$ -2	.50	$\frac{3}{8}$	$2\frac{1}{2}$	18

The Hanger Rod Coupling is designed for use under hollow tile and cinder concrete construction.

For hanging pipe up to 2 inches in size from hollow tile construction, the Hanger Rod Coupling is used with the Toggle Bolt as illustrated.

For hanging pipe $2\frac{1}{2}$ inches and larger from hollow tile construction and all sizes of pipe from cinder concrete construction, the Hanger Rod Coupling is used in connection with rods which are installed in holes drilled through the entire tile or cinder concrete slab, the nut or bolt head at upper end of rod resting on a plate washer.

The Hanger Rod Coupling allows for adjustment to take care of varying thicknesses of plaster.

Order by Figure Number.

HANGERS

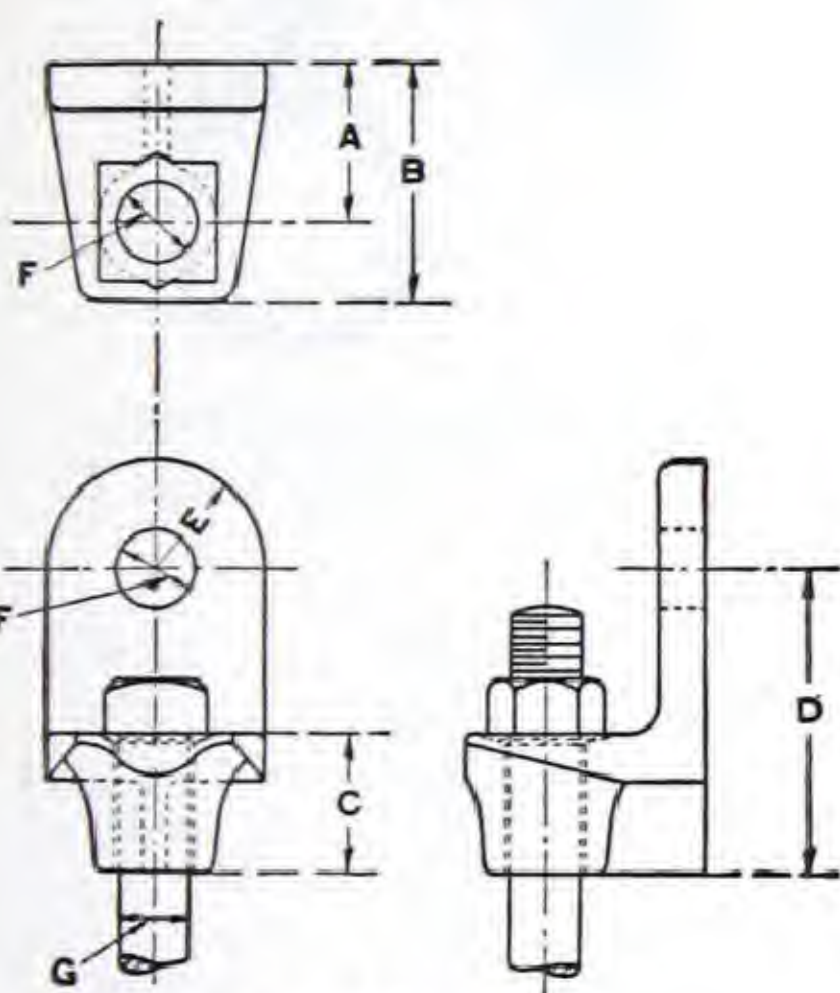
Grinnell Side Beam and Side Column Brackets
Malleable IronSide Beam Bracket
Fig. No. 202

Fig. No. 202

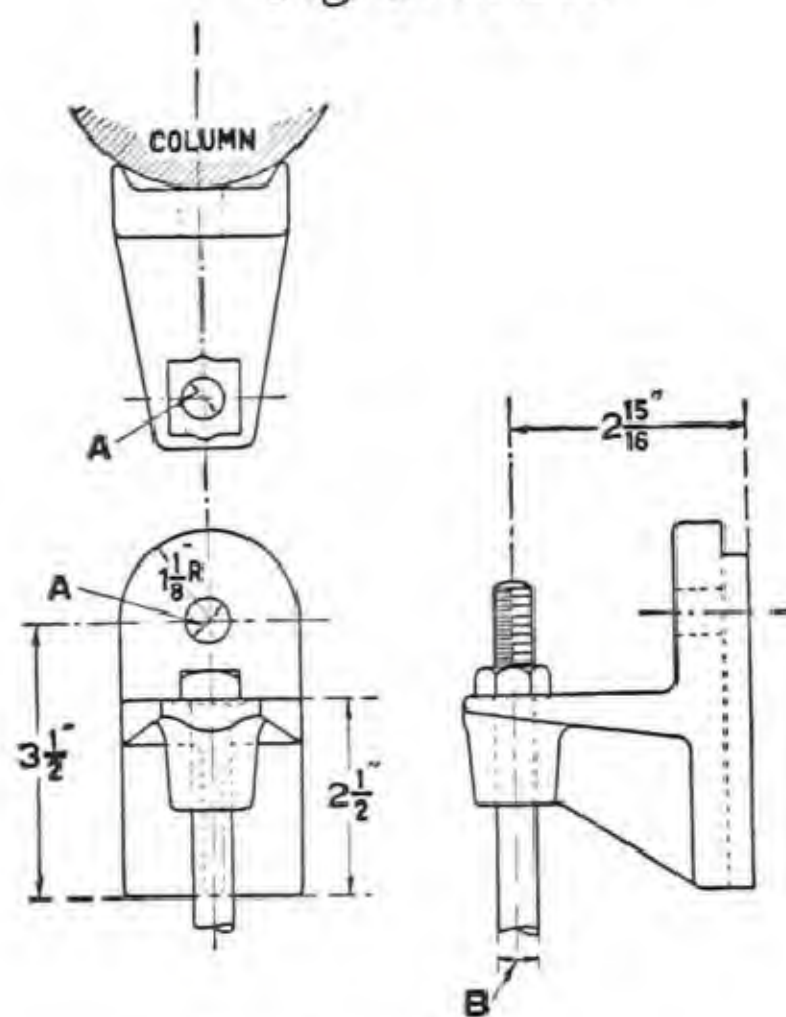
Side Column Bracket
Fig. No. 203

Fig. No. 203

LIST PRICES AND DIMENSIONS—Fig. No. 202

Pipe Size Inches	Bracket No.	Price Each	A	B	C	D	E	F	G
$\frac{3}{4}$ -2	1	.12	$\frac{7}{8}$	$1\frac{3}{8}$	$1\frac{5}{16}$	$2\frac{5}{16}$	$\frac{5}{8}$	$\frac{7}{16}$	$\frac{3}{8}$
$2\frac{1}{2}$ - $3\frac{1}{2}$	2	.15	$1\frac{3}{16}$	$1\frac{13}{16}$	$1\frac{3}{8}$	$2\frac{11}{16}$	$\frac{13}{16}$	$\frac{9}{16}$	$1\frac{1}{2}$
4-5	3	.35	$1\frac{7}{16}$	$2\frac{3}{16}$	$1\frac{1}{2}$	3	1	$\frac{3}{4}$	$\frac{5}{8}$
6-7	4	.40	$1\frac{11}{16}$	$2\frac{9}{16}$	$1\frac{5}{8}$	$3\frac{3}{8}$	$1\frac{5}{8}$	$\frac{7}{8}$	$\frac{3}{4}$
8-12	5	.60	2	3	$1\frac{3}{4}$	$3\frac{13}{16}$	$1\frac{3}{8}$	1	$\frac{7}{8}$

LIST PRICES—Fig. No. 203

Pipe Size	Bracket No.	Price Each	A	B
$\frac{3}{4}$ -2	1	.50	$\frac{7}{16}$	$\frac{3}{8}$
$2\frac{1}{2}$ - $3\frac{1}{2}$	2	.70	$\frac{9}{16}$	$1\frac{1}{2}$

Fig. No. 202 Side Beam Bracket provides a simple, practical and adjustable means of securing hangers to side of beams, etc.

Fig. No. 203, side column bracket is similar to Fig. No. 202 except that its construction provides for attachment to a column as illustrated.

Order by Figure Number.

HANGERS

Grinnell Cantilever Brackets

Cast Iron



Cantilever Bracket
Fig. No. 221



Cantilever Bracket with Angle
Iron Extension—Fig. No. 222

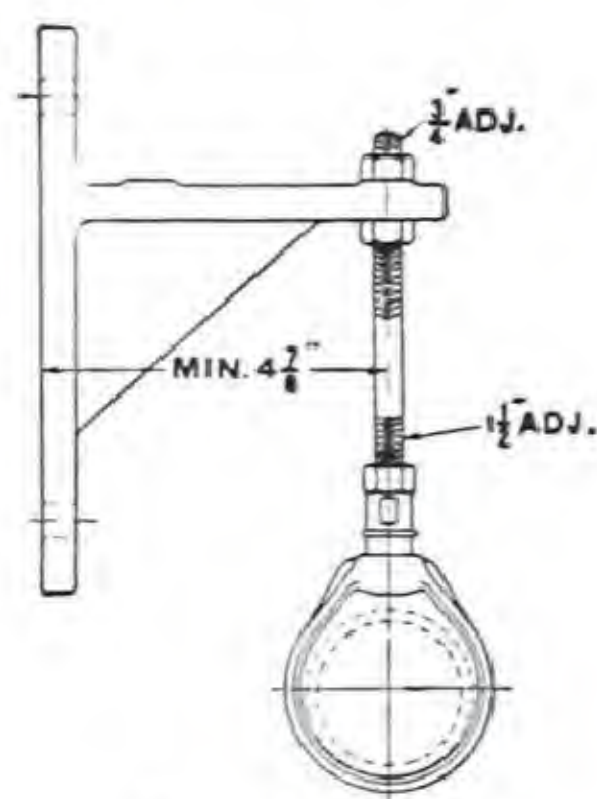


Fig. No. 221

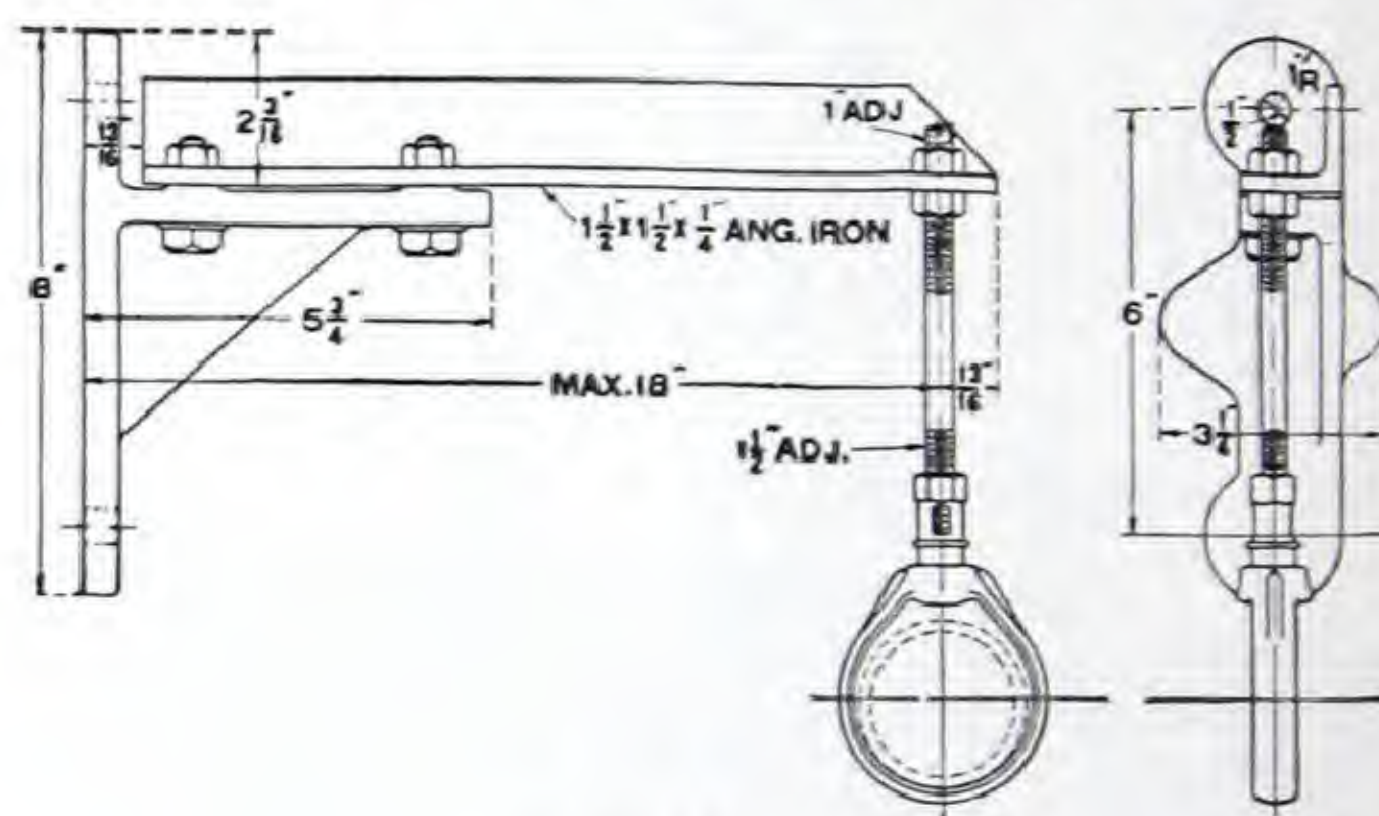


Fig. No. 222

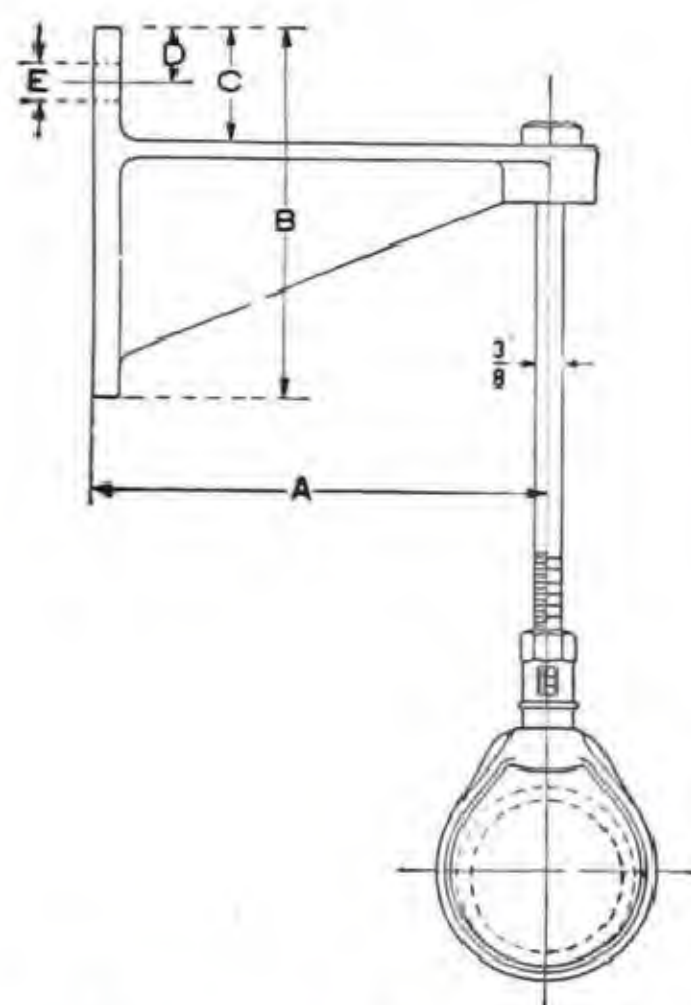
LIST PRICES

Pipe Size Inches	Bracket Only Fig. No. 221 Each	Bracket and Angle Iron Only Fig. No. 222 Each
$\frac{3}{4}$ to 2	\$1.30	\$3.00

Bracket only (Fig. No. 221) is used where lines are located $4\frac{7}{8}$ inches from walls. Where lateral extension is necessary, this bracket is used to support an extending angle iron (see Fig. No. 222), there being two bolt holes in the arm of the bracket for attaching the angle iron. The holes in the bracket are slotted allowing for lateral adjustment to take care of uneven wall surfaces.

Order by Figure Number.

HANGERS

*Grinnell Cast Iron Brackets**For 2-inch and Smaller Pipe*Cast Iron Bracket
Fig. No. 223

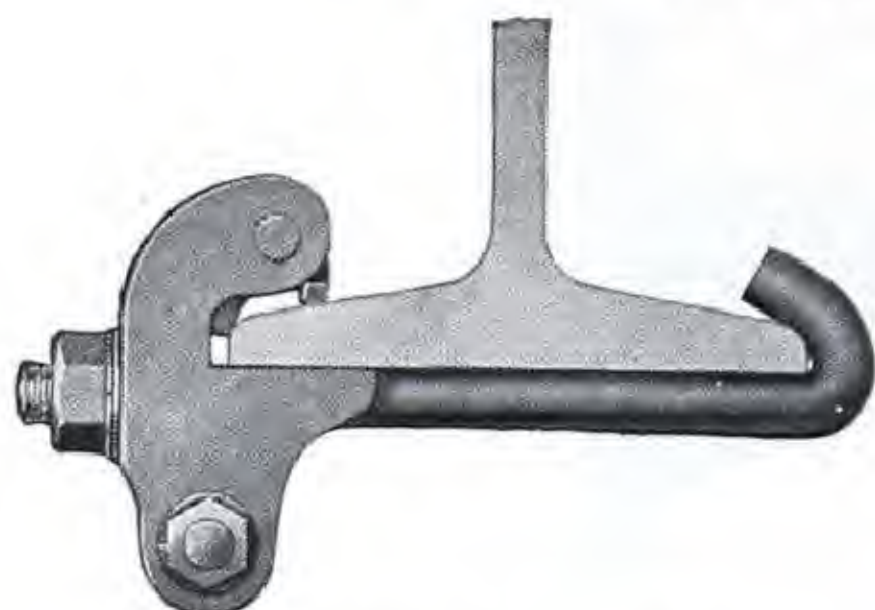
Showing Application

LIST PRICES (BRACKET ONLY)—Fig. No. 223

Bracket Number	DIMENSIONS					PRICE EACH	
	A	B	C	D	E	Black	Galv.
1	6	4 ⁵ / ₁₆	1 ¹ / ₂	³ / ₄	¹ / ₂	\$0.50	\$0.75
2	9	5 ¹ / ₄	1 ¹ / ₂	³ / ₄	¹ / ₂	.80	1.10

This light weight cast iron bracket, while primarily designed for use in connection with open sprinklers on the outside of buildings, is entirely suitable for use in supporting wall piping in any service. It can readily be installed on walls, columns or beams. Bracket is regularly furnished galvanized, but can be furnished black on order. When ordering, please specify whether black or galvanized is required. Order by Figure Number.

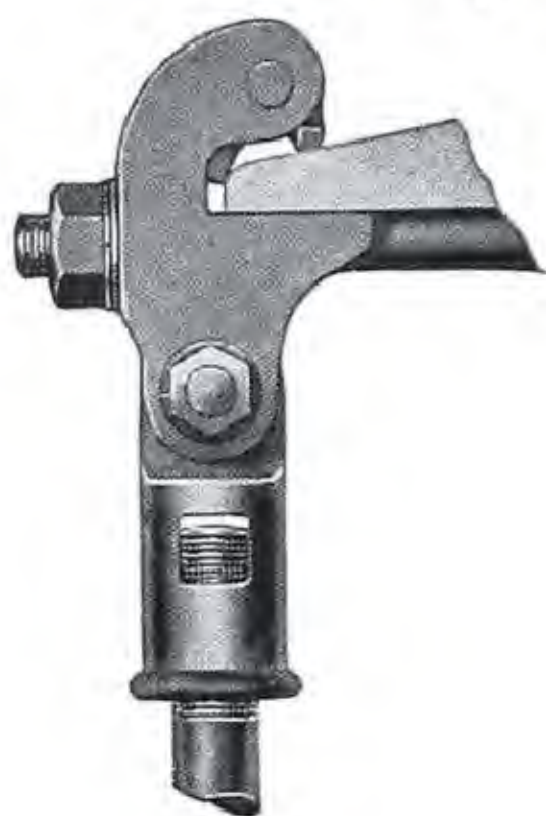
HANGERS

*Grinnell Universal Side I Beam Clamps**Grinnell Universal Channel Clamps**Malleable Iron*

Universal Side I Beam Clamp
Fig. No. 225



Universal Channel Clamp
Fig. No. 226



Application of
Extension Piece,
Fig. No. 157 and
Hanger Rod to
Universal Clamps
(See pages 402 and 410)



Application of
Adjustable Swivel Ring,
Fig. No. 101 and Extension
Eye Bolt, Fig. No. 220
to Universal Clamps
(See pages 391 and 416)



Application of Swivel
Pipe Ring,
Fig. No. 150 to
Universal Clamps
(See page 417)

List Prices on opposite page.
Dimensions of Beams and Channels with Corresponding Clamp Numbers on following pages.

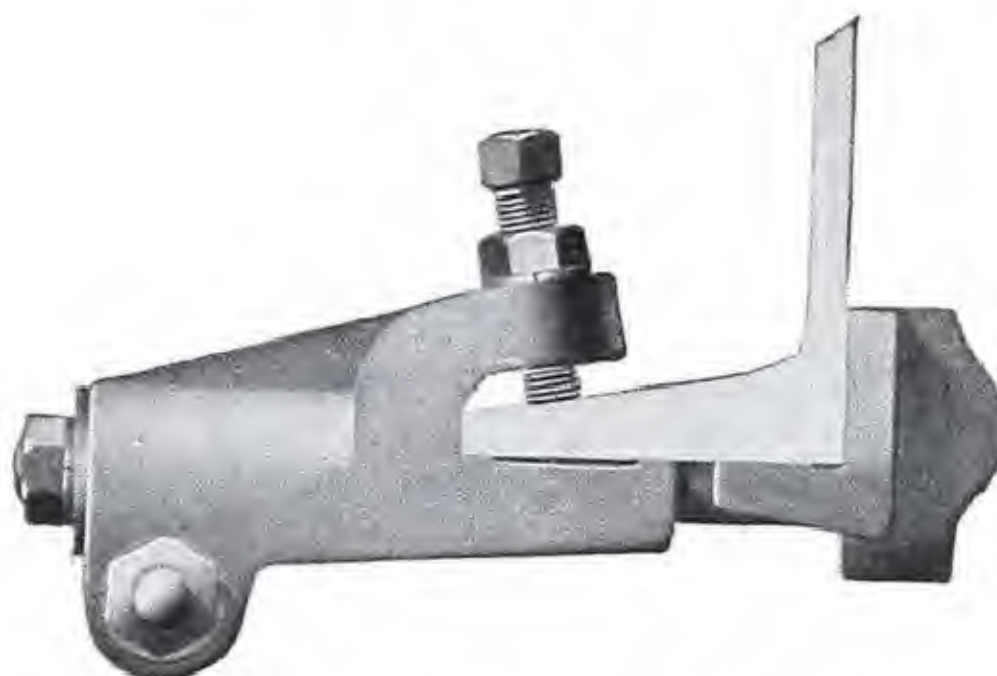
Order by Figure Number and Clamp Number.

HANGERS

*Grinnell Center I Beam Clamps**Grinnell Channel Extension Clamps*

Center I Beam Clamp
Fig. No. 217

For 3/4" to 2" Pipe Only



Channel Extension Clamp
Fig. No. 219

For 3/4" to 2" Pipe Only

UNIVERSAL I BEAM CLAMPS—Fig. No. 225

Pipe Sizes	List Prices	CLAMP NUMBERS		
		Standard or Carnegie Structural I Beams	Carnegie Supplemental I Beams	Bethlehem I Beams
3/4-2	\$0.50	1-A, B, C, D, E	1-T, U, V, W, X	1-T, U, V
	.55	2-E, F, G	2-X	2-U, V, W, X, Y
	.60	3-G, H, I	.....	3-V, W, X, Y, Z
2 1/2-7	.85	4-A, B, C, D, E,	4-S, T, U, V, W, X	4-S, T, U
	.90	5-E, F, G	5-X	5-T, U, V, W, X, Y
	.95	6-G, I	.....	6-U, V, X, Y, Z
8 -12	1.30	7-A, B, C, D, E	7-S, T, U, V, W, X	7-S, T, U, V
	1.35	8-E, F, G	8-X	8-U, V, W, X, Y
	1.40	9-G, H, I	.....	9-V, W, X, Y, Z

CENTER I BEAM CLAMPS—Fig. No. 217

3/4-2 Only	\$0.30	1-A, B, C	1-X, Y	1-X, Y
		2-A, B	2-X, Y	2-W, X
		3-A, B	3-Y, Z	3-W, X, Y
	.40	4	4-Y	4-W, X, Y, Z
		5	.....	5-W, X, Y, Z
		6-Y	.....	6-W, X, Y

UNIVERSAL CHANNEL CLAMPS—Fig. No. 226

Pipe Sizes	List Prices	CLAMP NUMBERS
		Standard or Carnegie Structural Channels
3/4-2	\$0.65	1-A, B, C, D, E
2 1/2-7	1.00	4-A, B, C, D, E
8 -12	1.50	7-A, B, C, D, E

CHANNEL EXTENSION CLAMPS—Fig. No. 219

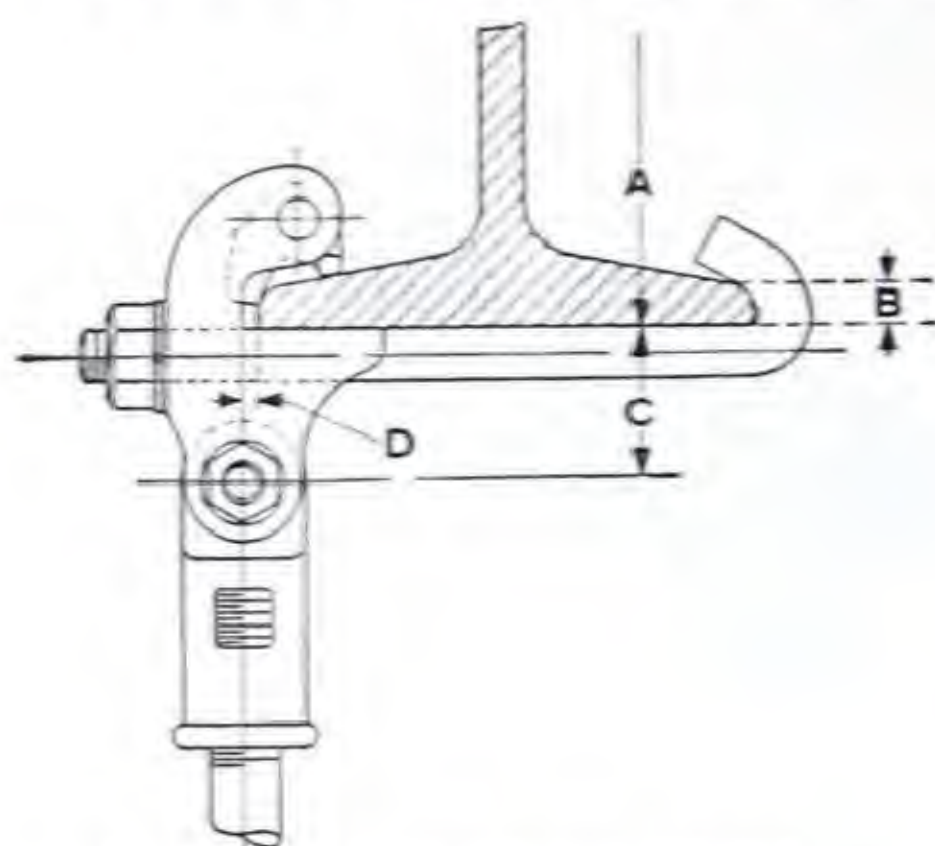
3/4-2 only	\$0.90	3-A, B, C, D, E, F, G
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Order by Figure Number and Clamp Number.

HANGERS

Dimensions and Clamp Numbers

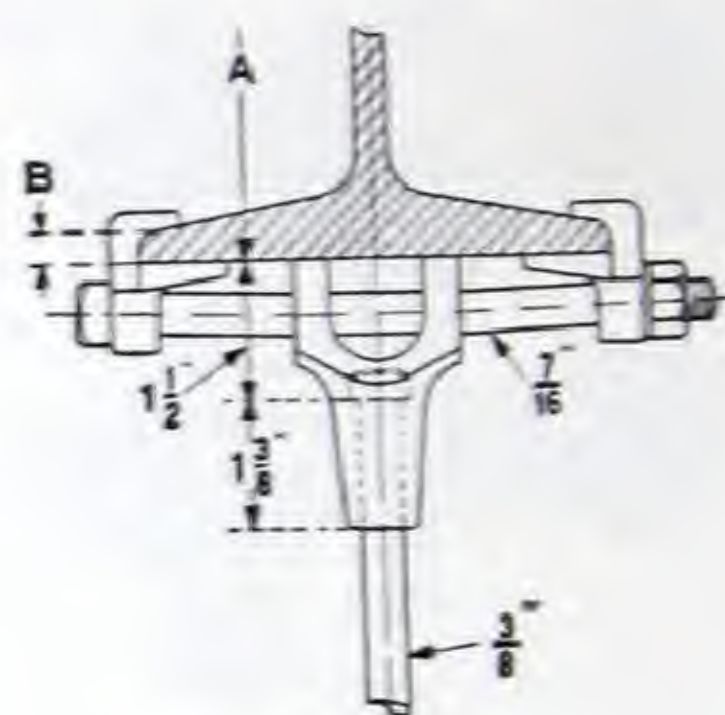
Standard or Carnegie Structural I Beams—I Beam Clamps



Universal Side I Beam Clamp

Fig. No. 225

†Ext. Piece—Fig. No. 157



Center I Beam Clamp

Fig. No. 217

For 3/4" to 2" Pipe Only

Notes:—Dimension C = 1 1/8" for 3/4" to 2" Pipe; 1 5/8" for 2 1/2" to 7" Pipe;
1 3/4" for 8" to 12" Pipe.

Dimension D—Varies from 1/8" to 1/2".

STANDARD OR CARNEGIE STRUCTURAL I BEAMS				CLAMP NUMBERS			
Size or Depth A	Weight per Foot in Pounds	Width of Flange	B Inches	Fig. No. 225			Fig. No. 217
				3/4" to 2" Pipe	2 1/2" to 7" Pipe	8" to 12" Pipe	3/4" to 2" Pipe
3	5.7	2 1/4	.17	1-A	4-A	7-A	.....
	6.5	2 3/8		1-A	4-A	7-A	.....
	7.5	2 3/4		1-A	4-A	7-A	.....
4	7.7	2 1/2	.19	1-A	4-A	7-B	.....
	8.5	2 3/8		1-B	4-A	7-B	.....
	9.5	2 3/4		1-B	4-A	7-B	.....
	10.5	2 7/8		1-B	4-B	7-B	.....
5	10.0	3	.21	1-B	4-B	7-B	.....
	12.25	3 1/4		1-B	4-B	7-B	.....
	14.75	3 1/2		1-B	4-B	7-C	.....
6	12.5	3 1/4	.23	1-B	4-B	7-C	1-A
	14.75	3 1/2		1-C	4-C	7-C	1-A
	17.25	3 3/4		1-C	4-C	7-C	1-A
7	15.3	3 1/2	.25	1-C	4-C	7-C	1-B
	17.5	3 3/4		1-C	4-C	7-C	1-B
	20.0	3 5/8		1-C	4-C	7-D	1-B
8	18.4	4	.27	1-C	4-C	7-D	1-C
	20.5	4 1/4		1-C	4-C	7-D	1-C
	23.0	4 1/2		1-D	4-D	7-D	1-C
	25.5	4 3/4		1-D	4-D	7-D	1-C

†Extension Piece, Fig. No. 157, is not part of Clamp.
Order by Figure Number and Clamp Number.

HANGERS

Dimensions and Clamp Numbers (Continued)

STANDARD OR CARNEGIE STRUCTURAL I BEAMS				CLAMP NUMBERS			
Size or Depth A	Weight per Foot in Pounds	Width of Flange	B Inches	Fig. No. 225			Fig. No. 217
				$\frac{3}{4}$ " to 2" Pipe	$2\frac{1}{2}$ " to 7" Pipe	8" to 12" Pipe	$\frac{3}{4}$ " to 2" Pipe
9	21.8	$4\frac{21}{64}$	.29	1-D	4-D	7-D	2-A
	25.0	$4\frac{17}{64}$		1-D	4-D	7-D	2-A
	30.0	$4\frac{19}{32}$		1-D	4-D	7-E	2-A
	35.0	$4\frac{49}{64}$		1-D	4-D	7-E	2-A
10	25.4	$4\frac{21}{32}$	.31	1-D	4-D	7-E	2-B
	30.0	$4\frac{51}{64}$		1-E	4-D	7-E	2-B
	35.0	$4\frac{15}{16}$		1-E	4-E	7-E	2-B
	40.0	$5\frac{3}{32}$		1-E	4-E	7-E	2-B
12	31.8	5	.35	1-E	4-E	7-E	2-B
	35.0	$5\frac{5}{64}$		1-E	4-E	7-E	2-B
12	40.8	$5\frac{1}{4}$	.46	2-E	5-E	8-E	3-A
	45.0	$5\frac{23}{64}$		2-E	5-E	8-E	3-A
	50.0	$5\frac{31}{64}$		2-E	5-E	8-F	3-A
	55.0	$5\frac{19}{32}$		2-E	5-E	8-F	3-A
15	42.9	$5\frac{1}{2}$	.41	2-E	5-E	8-F	3-A
	45.0	$5\frac{35}{64}$		2-E	5-E	8-F	3-A
	50.0	$5\frac{41}{64}$		2-E	5-E	8-F	3-A
	55.0	$5\frac{47}{64}$		2-F	5-E	8-F	3-A
15	60.8	6	.59	2-F	5-F	8-G	4
	65.0	$6\frac{5}{64}$		2-F	5-F	8-G	4
	70.0	$6\frac{13}{64}$		2-G	5-F	8-G	4
	75.0	$6\frac{9}{32}$		2-G	5-F	8-G	4
18	54.7	6	.46	2-F	5-F	8-F	3-B
	60.0	$6\frac{3}{32}$		2-F	5-F	8-F	3-B
	65.0	$6\frac{11}{64}$		2-F	5-F	8-F	3-B
	70.0	$6\frac{1}{4}$		2-F	5-F	8-G	3-B
18	75.6	7	.659	3-G	6-G	9-G	5
	80.0	$7\frac{5}{64}$		3-G	6-G	9-H	5
	85.0	$7\frac{5}{32}$		3-H	6-G	9-H	5
	90.0	$7\frac{15}{64}$		3-H	6-G	9-H	5
20	65.4	$6\frac{1}{4}$	.55	2-G	5-F	8-G	4
	70.0	$6\frac{5}{16}$		2-G	5-F	8-G	4
	75.0	$6\frac{25}{64}$		2-G	5-G	8-G	4
20	81.4	7	.65	3-G	6-G	9-G	5
	85.0	$7\frac{3}{64}$		3-G	6-G	9-H	5
	90.0	$7\frac{1}{8}$		3-G	6-G	9-H	5
	95.0	$7\frac{13}{64}$		3-G	6-G	9-H	5
	100.0	$7\frac{17}{64}$		3-H	6-G	9-H	5

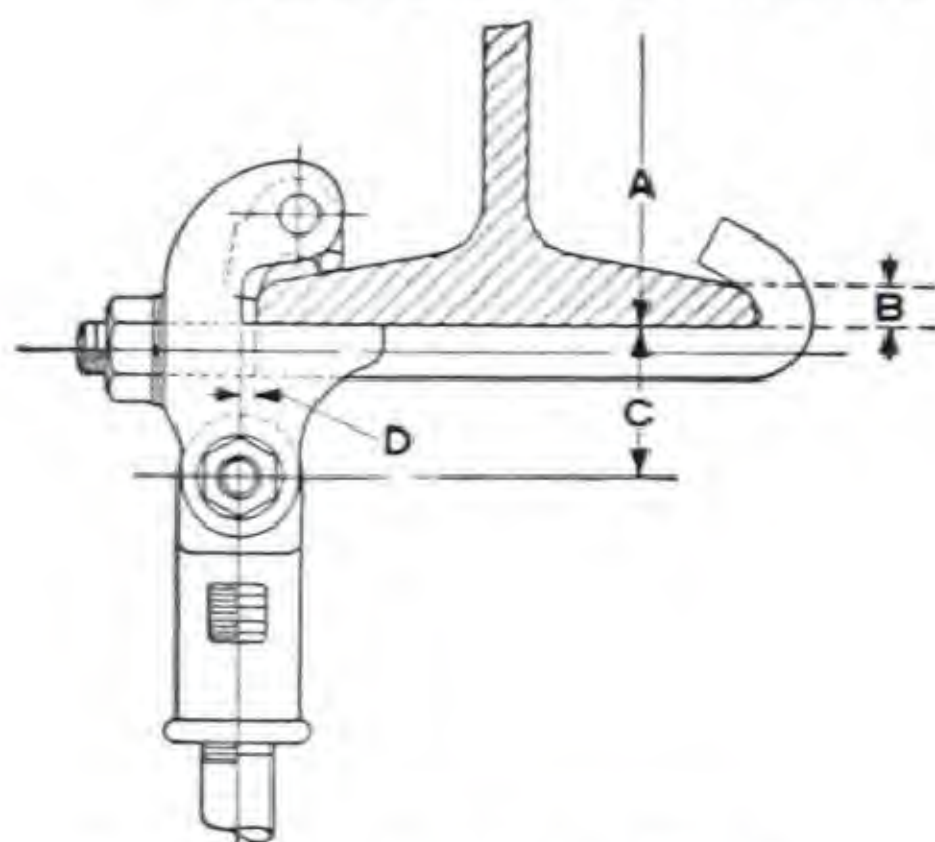
Order by Figure Number and Clamp Number.

(Continued)

HANGERS

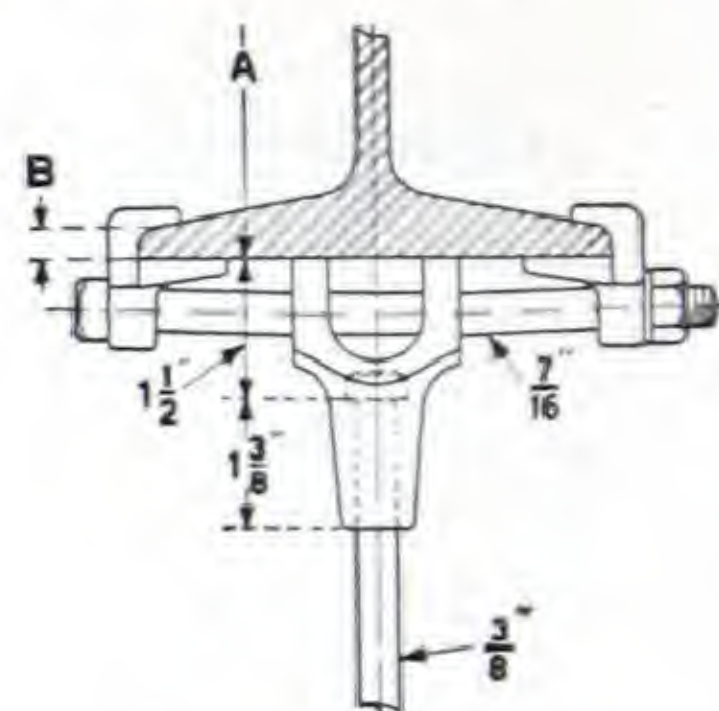
Dimensions and Clamp Numbers (Continued)

Standard or Carnegie Structural I Beams and
Carnegie Supplemental I Beams—I Beam Clamps



Universal Side I Beam Clamp
Fig. No. 225

†Ext. Piece—Fig. No. 157



Center I Beam Clamp
Fig. No. 217

For 3/4" to 2" Pipe Only

Notes:—Dimension C = 1 1/8" for 3/4" to 2" pipe; 1 5/8" for 2 1/2" to 7" pipe;
1 3/4" for 8" to 12" pipe.

Dimension D—Varies from 1/8" to 1/2"

STANDARD OR CARNEGIE STRUCTURAL I BEAMS				CLAMP NUMBERS			
Size or Depth A	Weight per Foot in Pounds	Width of Flange	B Inches	Fig. No. 225			Fig. No. 217
				$\frac{3}{4}$ " to 2" Pipe	$2\frac{1}{2}$ " to 7" Pipe	8" to 12" Pipe	$\frac{3}{4}$ " to 2" Pipe
24	79.9	7	.60	3-G	6-G	9-G	5
	85.0	$7\frac{1}{8}$		3-G	6-G	9-G	5
	90.0	$7\frac{1}{8}$		3-G	6-G	9-G	5
	95.0	$7\frac{3}{8}$		3-G	6-G	9-H	5
	100.0	$7\frac{1}{4}$		3-G	6-G	9-H	5
24	105.9	$7\frac{7}{8}$	.80	3-I	6-I	9-I	6-Y
	110.0	$7\frac{5}{4}$		3-I	6-I	9-I	6-Y
	115.0	$7\frac{5}{4}$		3-I	6-I	9-I	6-Y
	120.0	$8\frac{3}{4}$		3-I	6-I	9-I	6-Y
CARNEGIE SUPPLEMENTAL I BEAMS				CLAMP NUMBERS			
8	17.5	5	.24	1-T	4-S	7-S	1-X
10	22.4	$5\frac{1}{2}$	.26	1-T	4-S	7-T	1-Y
12	27.9	6	.28	1-U	4-T	7-T	2-X
15	37.3	$6\frac{3}{4}$	.31	1-V	4-U	7-U	2-X
18	48.2	$7\frac{1}{2}$	.34	1-W	4-V	7-V	2-Y
21	60.4	$8\frac{1}{4}$	.37	1-X	4-W	7-W	3-Y
24	74.2	9	.40	1-X	4-X	7-X	3-Z
27	90.0	9	.515	2-X	5-X	8-X	4-Y

†Extension Piece, Fig. No. 157, is not part of Clamp.
Order by Figure Number and Clamp Number.

HANGERS

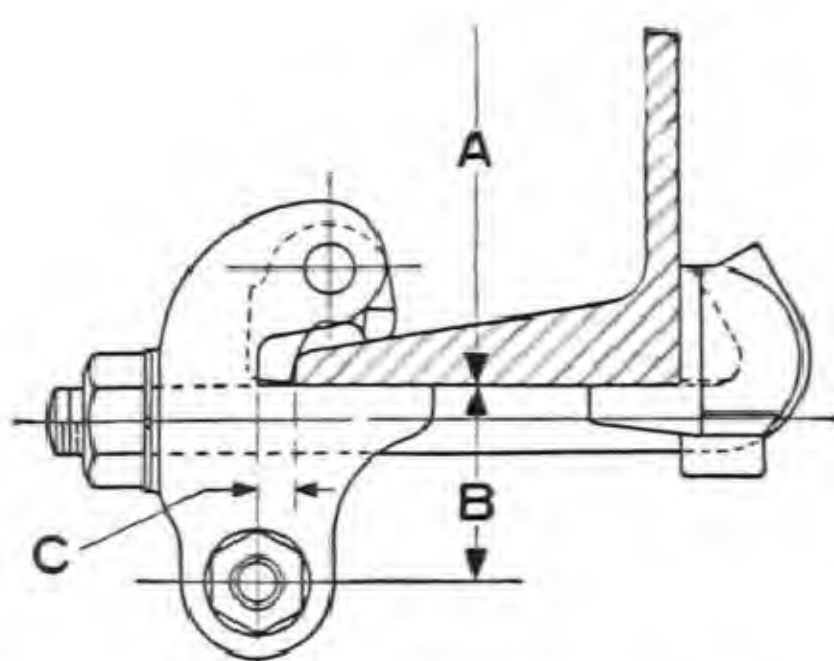
Dimensions and Clamp Numbers

Bethlehem I Beams—I Beam Clamps

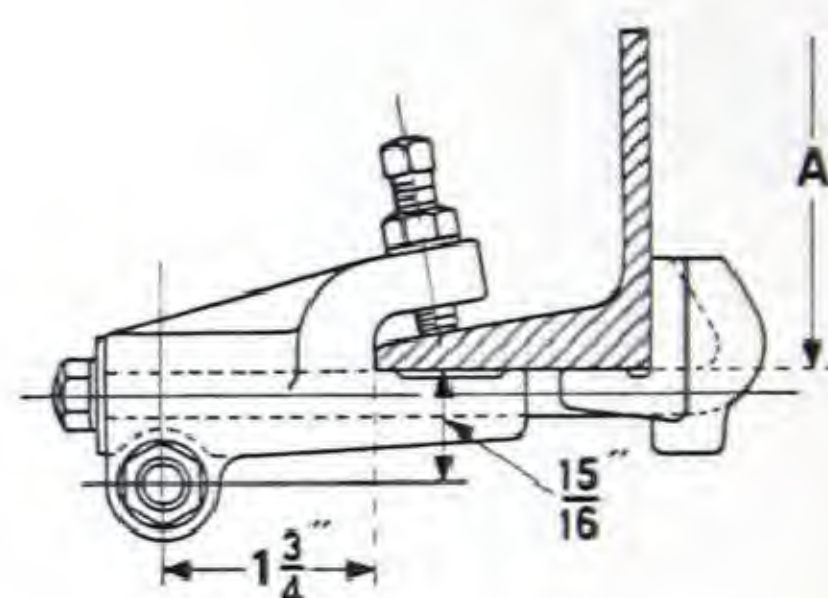
BETHLEHEM I BEAMS				CLAMP NUMBERS			
Size or Depth A	Weight per Foot in Pounds	Width of Flange	B Inches	Fig. No. 225			Fig. No. 217
				$\frac{3}{4}$ " to 2" Pipe	$2\frac{1}{2}$ " to 7" Pipe	8" to 12" Pipe	$\frac{3}{4}$ " to 2" Pipe
8	17.5	$5\frac{1}{4}$	.21	1-F	4-S	7-S	1-X
	19.0	$5\frac{1}{4}$	.24	1-T	4-S	7-S	1-X
9	20.5	$5\frac{1}{2}$	.25	1-F	4-S	7-T	1-Y
	22.0	$5\frac{1}{2}$	.28	1-T	4-S	7-T	1-Y
10	23.5	$5\frac{3}{4}$	.285	1-U	4-T	7-T	1-Y
	26.0	$5\frac{3}{4}$	.330	1-U	4-T	7-T	2-W
12	28.5	$6\frac{1}{4}$	.325	1-U	4-T	7-U	2-X
	31.0	$6\frac{1}{4}$	.355	1-U	4-T	7-U	3-W
12	36.5	$6\frac{3}{8}$	.440	2-U	5-T	8-U	3-W
15	38.5	$6\frac{3}{4}$	.400	1-V	4-U	7-V	3-X
	40.0	$6\frac{3}{4}$	.415	2-V	5-U	8-U	3-X
	42.5	$6\frac{3}{4}$	.445	2-V	5-U	8-U	3-X
15	50.5	$6\frac{3}{2}$	.540	2-V	5-U	8-V	4-X
	54.5	7	.600	2-V	5-V	8-V	4-X
	59.5	$7\frac{3}{4}$	.660	3-V	6-U	9-V	5-Z
15	71.5	$7\frac{1}{2}$	.785	3-W	6-V	9-W	6-Y
18	49.0	$7\frac{1}{2}$	.435	2-W	5-V	8-V	3-Y
	52.0	$7\frac{1}{2}$	.465	2-W	5-V	8-V	3-Y
	54.5	$7\frac{3}{4}$	.495	2-W	5-V	8-V	4-X
18	64.5	$8\frac{1}{4}$	.525	2-X	5-X	8-X	4-Y
	69.0	$8\frac{3}{4}$	.585	2-X	5-X	8-X	4-Y
	74.0	$8\frac{3}{4}$	.645	3-X	6-X	9-X	5-W
20	59.5	8	.485	2-W	5-W	8-W	4-W
	62.0	$8\frac{1}{4}$	.515	2-W	5-W	8-W	4-W
	64.5	$8\frac{1}{2}$	.545	2-X	5-W	8-W	4-W
20	73.0	$8\frac{7}{8}$	.580	2-X	5-X	8-X	4-Y
	78.0	$8\frac{2}{2}$	.625	3-X	6-X	9-X	5-W
22	65.5	$8\frac{1}{2}$	.485	2-X	5-W	8-X	4-Y
	68.5	$8\frac{3}{4}$	.515	2-X	5-W	8-X	4-Y
	71.5	$8\frac{1}{2}$	.545	2-X	5-W	8-X	4-Y
24	73.5	9	.520	2-X	5-X	8-X	4-Y
	79.5	$9\frac{1}{2}$	.565	2-X	5-X	8-Y	4-Y
24	84.5	$9\frac{1}{2}$	.570	2-Y	5-Y	8-Y	4-Z
24	95.5	$9\frac{1}{4}$	.660	3-Y	6-Y	9-Y	5-Y
	99.5	$9\frac{3}{4}$	.705	3-Y	6-Y	9-Y	6-W
	104.5	$9\frac{3}{2}$	.750	3-Z	6-Z	9-Z	6-X
26	85.5	$9\frac{1}{4}$	.545	2-Y	5-Y	8-Y	4-Z
	91.0	$9\frac{1}{2}$	.605	2-Y	5-Y	8-Y	5-Y
	98.0	$9\frac{1}{2}$	.665	3-Y	6-Y	9-Y	5-Y
28	100.0	$9\frac{3}{4}$	.620	3-Y	6-Y	9-Z	5-Y
	106.0	10	.680	3-Z	6-Y	9-Z	5-Y
	113.0	$10\frac{1}{2}$	.740	3-Z	6-Z	9-Z	6-X
30	115.0	$10\frac{3}{4}$	.680	3-Z	6-Z	9-Z	5-Y
	121.0	$10\frac{1}{2}$	.740	3-Z	6-Z	9-Z	6-X
	129.0	$10\frac{3}{2}$	.800	3-Z	6-Z	9-Z	6-X

Order by Figure Number and Clamp Number.

HANGERS

*Dimensions and Clamp Numbers**Standard or Carnegie Structural Channels—Channel Clamps*

Universal Channel Clamp
Fig. No. 226



Channel Extension Clamp
Fig. No. 219

For 3/4" to 2" Pipe Only

Notes:—Dimension B = $1\frac{1}{8}$ " for $\frac{3}{4}$ " to 2" pipe; $1\frac{5}{8}$ " for $2\frac{1}{2}$ " to 7" pipe;
 $1\frac{3}{4}$ " for 8" to 12" pipe.

Dimension C—Varies from $\frac{1}{8}$ " to $\frac{1}{2}$ ".

STANDARD OR CARNEGIE STRUCTURAL CHANNELS			CLAMP NUMBERS			
Size or Depth A	Weight per Foot in Pounds	Width of Flange	Fig. No. 226			Fig. No. 219
			$\frac{3}{4}$ " to 2" Pipe	$2\frac{1}{2}$ " to 7" Pipe	8" to 12" Pipe	$\frac{3}{4}$ " to 2" Pipe
3	4.1	$1\frac{1}{2}$	1-A	4-A	7-A	3-A
	5.0	$1\frac{1}{2}$	1-A	4-A	7-A	3-A
	6.0	$1\frac{1}{2}$	1-A	4-A	7-A	3-A
4	5.40	$1\frac{3}{4}$	1-A	4-A	7-A	3-A
	6.25	$1\frac{3}{4}$	1-A	4-A	7-A	3-A
	7.25	$1\frac{3}{4}$	1-A	4-A	7-A	3-A
5	6.7	$1\frac{3}{4}$	1-A	4-A	7-A	3-B
	9.0	$1\frac{3}{4}$	1-A	4-A	7-B	3-B
	11.5	$2\frac{1}{2}$	1-A	4-A	7-B	3-B
6	8.2	$1\frac{5}{8}$	1-A	4-A	7-B	3-B
	10.5	$2\frac{1}{2}$	1-A	4-A	7-B	3-B
	13.0	$2\frac{3}{2}$	1-B	4-A	7-B	3-B
	15.5	$2\frac{3}{2}$	1-B	4-B	7-B	3-B
7	9.80	$2\frac{3}{2}$	1-A	4-A	7-B	3-B
	12.25	$2\frac{3}{2}$	1-B	4-B	7-B	3-B
	14.75	$2\frac{3}{2}$	1-B	4-B	7-B	3-B
	17.25	$2\frac{3}{2}$	1-B	4-B	7-B	3-B
	19.75	$2\frac{3}{2}$	1-B	4-B	7-B	3-B

Order by Figure Number and Clamp Number.

HANGERS

*Dimensions and Clamp Numbers (Continued)**Standard or Carnegie Structural Channels—Channel Clamps*

STANDARD OR CARNEGIE STRUCTURAL CHANNELS			CLAMP NUMBERS			
Size or Depth A	Weight per Foot in Pounds	Width of Flange	Fig. No. 226			Fig. No. 219
			$\frac{3}{4}$ " to 2" Pipe	$2\frac{1}{2}$ " to 7" Pipe	8" to 12" Pipe	$\frac{3}{4}$ " to 2" Pipe
8	11.50	$2\frac{1}{8}$	1-B	4-B	7-B	3-C
	13.75	$2\frac{1}{4}$	1-B	4-B	7-B	3-C
	16.25	$2\frac{3}{8}$	1-B	4-B	7-B	3-C
	18.75	$2\frac{1}{2}$	1-B	4-B	7-B	3-C
	21.25	$2\frac{5}{8}$	1-B	4-B	7-C	3-C
9	13.4	$2\frac{1}{8}$	1-B	4-B	7-B	3-C
	15.0	$2\frac{3}{16}$	1-B	4-B	7-B	3-C
	20.0	$2\frac{1}{4}$	1-B	4-B	7-C	3-C
	25.0	$2\frac{3}{8}$	1-B	4-B	7-C	3-C
10	15.3	$2\frac{3}{16}$	1-B	4-B	7-C	3-D
	20.0	$2\frac{1}{4}$	1-B	4-B	7-C	3-D
	25.0	$2\frac{5}{16}$	1-C	4-C	7-C	3-D
	30.0	$3\frac{3}{16}$	1-C	4-C	7-C	3-D
	35.0	$3\frac{1}{8}$	1-C	4-C	7-C	3-D
12	20.7	$2\frac{1}{8}$	1-C	4-C	7-C	3-E
	25.0	$3\frac{3}{16}$	1-C	4-C	7-C	3-E
	30.0	$3\frac{1}{4}$	1-C	4-C	7-C	3-E
	35.0	$3\frac{5}{16}$	1-C	4-C	7-D	3-E
	40.0	$3\frac{3}{4}$	1-C	4-C	7-D	3-E
13	31.8	4	1-D	4-D	7-E	3-G
	35.0	$4\frac{5}{16}$	1-D	4-D	7-E	3-G
	37.0	$4\frac{7}{16}$	1-D	4-D	7-E	3-G
	40.0	$4\frac{3}{8}$	1-E	4-E	7-E	3-G
	45.0	$4\frac{13}{16}$	1-E	4-E	7-E	3-G
	50.0	$4\frac{1}{2}$	1-E	4-E	7-E	3-G
15	33.9	$3\frac{1}{2}$	1-D	4-D	7-D	3-F
	35.0	$3\frac{3}{4}$	1-D	4-D	7-D	3-F
	40.0	$3\frac{13}{16}$	1-D	4-D	7-D	3-F
	45.0	$3\frac{5}{8}$	1-D	4-D	7-D	3-F
	50.0	$3\frac{3}{2}$	1-D	4-D	7-D	3-F
	55.0	$3\frac{1}{8}$	1-D	4-D	7-E	3-F

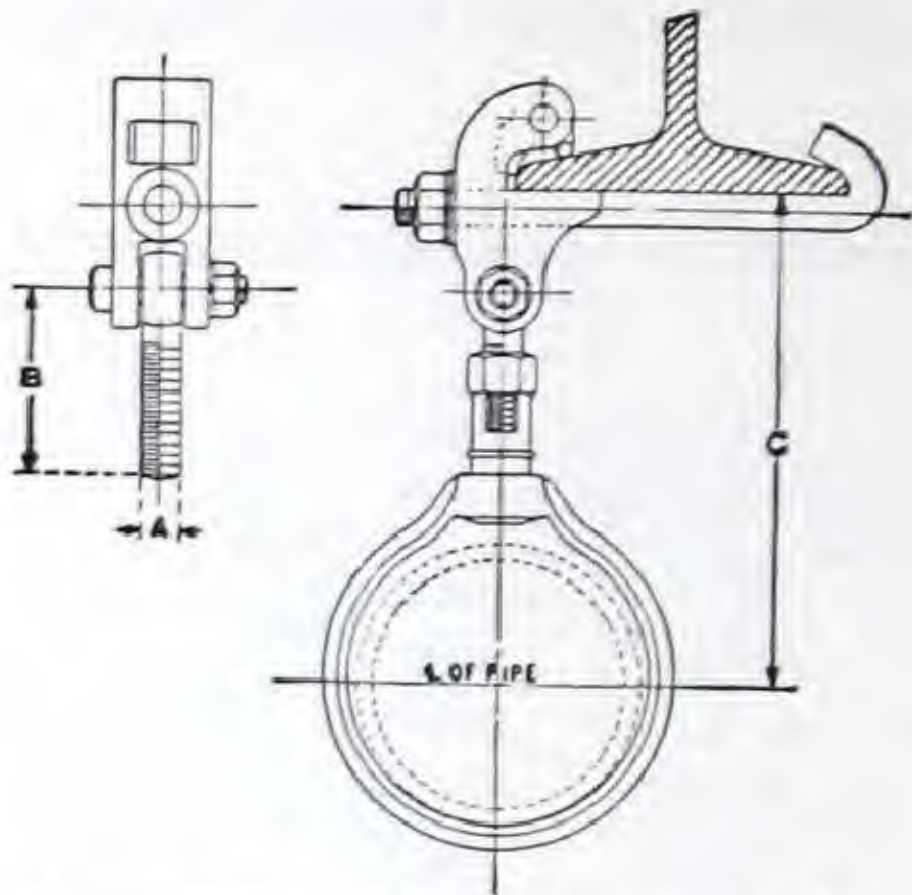
Order by Figure Number and Clamp Number.

HANGERS

Extension Eye Bolts



Extension Eye Bolt
Fig. No. 220



Application of Extension Eye Bolt
and Adj. Swivel Ring—Fig. No. 101
to Universal I Beam and Channel Clamps

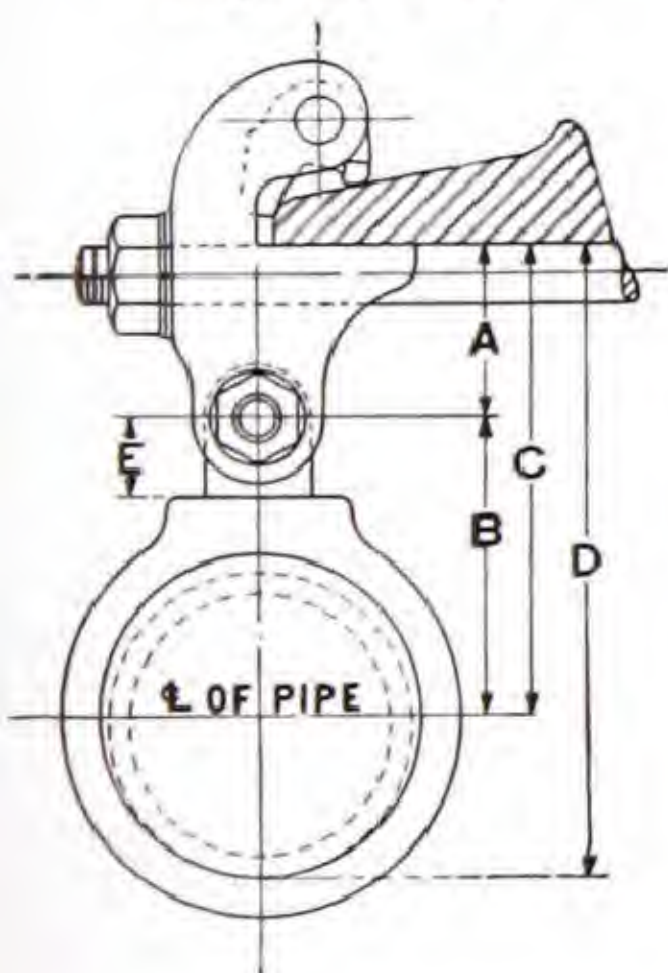
Extension Eye Bolt A	Pipe Size	List Prices	B	C		Length of Thread
				Min.	Max.	
$\frac{3}{8}$	$\frac{3}{4}$	\$0.25	$2\frac{1}{2}$	$4\frac{1}{4}$	$5\frac{3}{4}$	2
		.28	4	$5\frac{5}{8}$	$7\frac{1}{4}$	$2\frac{1}{4}$
		.30	$5\frac{1}{2}$	$7\frac{1}{8}$	$8\frac{3}{4}$	$2\frac{1}{4}$
	1	.25	$2\frac{1}{2}$	$4\frac{3}{8}$	6	2
		.28	4	$5\frac{3}{4}$	$7\frac{3}{8}$	$2\frac{1}{4}$
		.30	$5\frac{1}{2}$	$7\frac{3}{8}$	9	$2\frac{1}{4}$
	$1\frac{1}{4}$	.25	$2\frac{1}{2}$	$4\frac{1}{2}$	$6\frac{1}{8}$	2
		.28	4	6	$7\frac{5}{8}$	$2\frac{1}{4}$
		.30	$5\frac{1}{2}$	$7\frac{1}{2}$	$9\frac{1}{8}$	$2\frac{1}{4}$
	$1\frac{1}{2}$	.25	$2\frac{1}{2}$	$4\frac{5}{8}$	$6\frac{1}{4}$	2
		.28	4	$6\frac{1}{8}$	$7\frac{3}{4}$	$2\frac{1}{4}$
		.30	$5\frac{1}{2}$	$7\frac{5}{8}$	$9\frac{1}{4}$	$2\frac{1}{4}$
$\frac{1}{2}$	2	.25	$2\frac{1}{2}$	$4\frac{7}{8}$	$6\frac{1}{2}$	2
		.28	4	$6\frac{3}{8}$	8	$2\frac{1}{4}$
		.30	$5\frac{1}{2}$	$7\frac{7}{8}$	$9\frac{1}{2}$	$2\frac{1}{4}$
	$2\frac{1}{2}$	.30	$2\frac{3}{4}$	$6\frac{1}{8}$	$7\frac{5}{8}$	2
		.32	$4\frac{1}{4}$	$7\frac{3}{8}$	$9\frac{1}{8}$	$2\frac{1}{2}$
		.35	$5\frac{3}{4}$	$8\frac{7}{8}$	$10\frac{5}{8}$	$2\frac{1}{2}$
	3	.30	$2\frac{3}{4}$	$6\frac{1}{2}$	8	2
		.32	$4\frac{1}{4}$	$7\frac{5}{8}$	$9\frac{1}{2}$	$2\frac{1}{2}$
		.35	$5\frac{3}{4}$	$9\frac{1}{8}$	11	$2\frac{1}{2}$
	$3\frac{1}{2}$	.30	$2\frac{3}{4}$	$6\frac{3}{4}$	$8\frac{1}{4}$	2
		.32	$4\frac{1}{4}$	8	$9\frac{3}{4}$	$2\frac{1}{2}$
		.35	$5\frac{3}{4}$	$9\frac{3}{8}$	$11\frac{1}{4}$	$2\frac{1}{2}$

Order by Figure Number.

HANGERS

Extension Eye Bolts (Continued)

Extension Eye Bolt A	Pipe Size	List Prices	B	C		Length of Thread
				Min.	Max.	
$\frac{5}{8}$	4	\$0.35	3	$7\frac{7}{8}$	$9\frac{3}{8}$	$2\frac{1}{8}$
		.38	$4\frac{1}{2}$	$8\frac{3}{8}$	$10\frac{7}{8}$	$3\frac{1}{4}$
		.40	6	$9\frac{7}{8}$	$12\frac{3}{8}$	$3\frac{1}{4}$
	$4\frac{1}{2}$	.35	3	8	$9\frac{1}{2}$	$2\frac{1}{8}$
		.38	$4\frac{1}{2}$	$8\frac{5}{8}$	11	$3\frac{1}{4}$
		.40	6	$10\frac{1}{8}$	$12\frac{1}{2}$	$3\frac{1}{4}$
	5	.35	3	$8\frac{1}{4}$	$9\frac{3}{4}$	$2\frac{1}{8}$
		.38	$4\frac{1}{2}$	9	$11\frac{1}{4}$	$3\frac{1}{4}$
		.40	6	$10\frac{1}{2}$	$12\frac{3}{4}$	$3\frac{1}{4}$
$\frac{3}{4}$	6	.50	3	$9\frac{1}{2}$	$10\frac{7}{8}$	$2\frac{1}{8}$
		.55	$4\frac{1}{2}$	$9\frac{5}{8}$	$12\frac{3}{8}$	$3\frac{1}{2}$
		.60	6	11	$13\frac{7}{8}$	$3\frac{3}{4}$
	7	.50	3	$10\frac{1}{4}$	$11\frac{5}{8}$	$2\frac{1}{8}$
		.55	$4\frac{1}{2}$	$10\frac{3}{8}$	$13\frac{1}{8}$	$3\frac{1}{2}$
		.60	6	$11\frac{5}{8}$	$14\frac{5}{8}$	$3\frac{3}{4}$
$\frac{7}{8}$	8	.70	$3\frac{1}{4}$	$11\frac{5}{8}$	13	$2\frac{1}{4}$
		.80	$4\frac{3}{4}$	$11\frac{5}{8}$	$14\frac{1}{2}$	$3\frac{3}{4}$
		.90	$6\frac{1}{4}$	$12\frac{3}{8}$	16	$4\frac{1}{2}$

Swivel Pipe Ring
Fig. No. 150

SWIVEL PIPE RING

Pipe Size	List Prices	No. of Swivel Piece	A	B	C	D	E
$\frac{3}{4}$	\$0.10	1	$1\frac{1}{8}$	$2\frac{1}{2}$	$3\frac{5}{8}$	$3\frac{11}{16}$	$1\frac{7}{8}$
1	.12	1	$1\frac{1}{8}$	$2\frac{5}{8}$	$3\frac{9}{8}$	$3\frac{15}{16}$	$1\frac{7}{8}$
$1\frac{1}{4}$	.13	1	$1\frac{1}{8}$	$2\frac{9}{8}$	$3\frac{13}{8}$	$4\frac{1}{8}$	$1\frac{7}{8}$
$1\frac{1}{2}$	.15	1	$1\frac{1}{8}$	$2\frac{15}{8}$	$3\frac{19}{8}$	$4\frac{9}{16}$	$1\frac{7}{8}$
2	.17	1	$1\frac{1}{8}$	$2\frac{11}{16}$	$3\frac{13}{16}$	5	$1\frac{7}{8}$
$2\frac{1}{2}$	.22	2	$1\frac{5}{8}$	$2\frac{9}{8}$	$4\frac{17}{8}$	$5\frac{3}{4}$	$1\frac{7}{8}$
3	.26	2	$1\frac{5}{8}$	$3\frac{7}{8}$	$4\frac{27}{8}$	$6\frac{1}{4}$	$1\frac{7}{8}$
$3\frac{1}{2}$	.28	2	$1\frac{5}{8}$	$3\frac{15}{8}$	$5\frac{3}{4}$	$7\frac{3}{4}$	$1\frac{7}{8}$
4	.43	3	$1\frac{5}{8}$	$3\frac{7}{8}$	$5\frac{1}{2}$	$7\frac{3}{4}$	$1\frac{7}{8}$
$4\frac{1}{2}$	.52	3	$1\frac{5}{8}$	$4\frac{1}{8}$	$5\frac{3}{4}$	$8\frac{1}{4}$	$1\frac{7}{8}$
5	.55	3	$1\frac{5}{8}$	$4\frac{3}{8}$	6	$8\frac{3}{4}$	$1\frac{7}{8}$
6	.60	4	$1\frac{5}{8}$	$5\frac{1}{16}$	$6\frac{11}{16}$	10	$1\frac{7}{8}$
7	.95	4	$1\frac{5}{8}$	$5\frac{9}{16}$	$7\frac{3}{16}$	11	$1\frac{7}{8}$
8	1.40	5	$1\frac{3}{4}$	$6\frac{3}{16}$	$7\frac{15}{16}$	$12\frac{1}{4}$	$1\frac{7}{8}$

Sketch at left shows application of Swivel Pipe Ring to Universal I Beam and Channel Clamps.

Order by Figure Number.

HANGERS

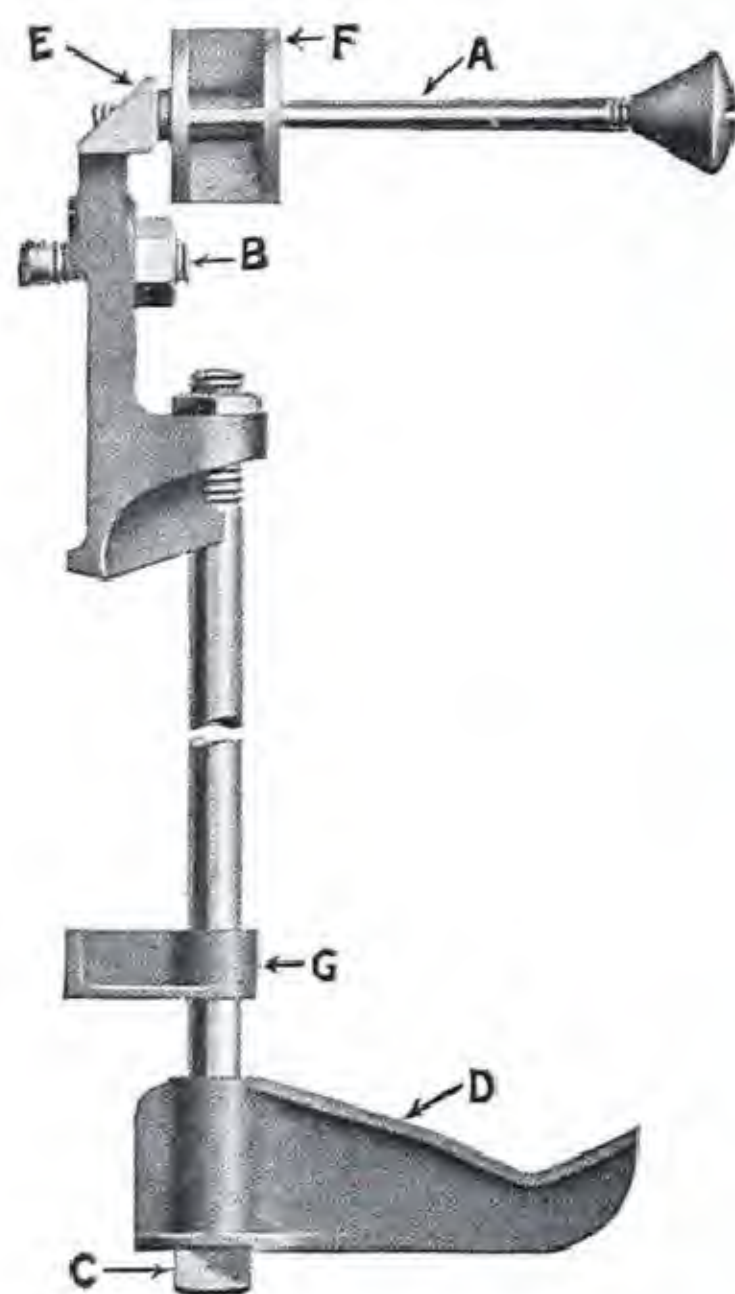
*Grinnell Adjustable Column Radiator Brackets**Malleable Iron*

Fig. No. 189

Grinnell Column Radiator Brackets are designed to support legless column radiators, both standard and hospital types. The foot D is furnished in either of three patterns to suit Single, Two or Three Column Radiators. Tie rod A is also furnished in three lengths.

These Column Radiator Brackets are very similar to our Wall Radiator Brackets, illustrated and described on following pages, and have all of the practical and economical features of the Wall Radiator Brackets.

When installed the bracket is practically out of sight. (See illustration of Wall Radiator on Bracket.)

Only one bolt is necessary to securely fasten the bracket to the wall.

When hook bolt is used, it can be set without extremely accurate measurements because there is a liberal adjustment of the bracket vertically by simply turning the bolt head C.

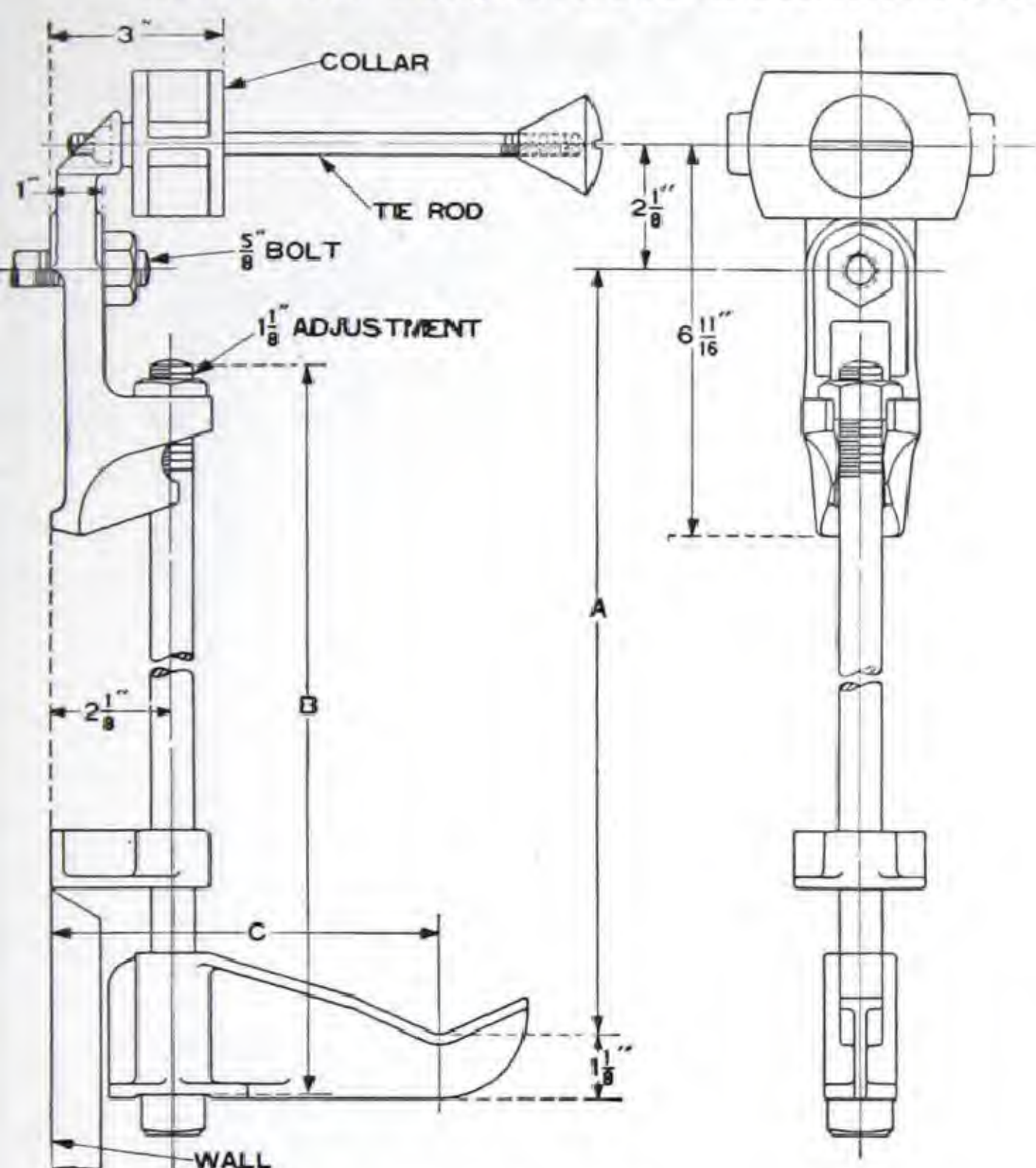
The tie rod A, in connection with the slotted head E of the bracket, is adjustable and consequently will always strike between the sections of the radiator no matter where the bracket is placed.

As only three points of the bracket touch the wall, the difficulty so often experienced with uneven walls is practically eliminated.

The back stop G, which slides on the supporting rod C, is designed to bear on the wall just above the baseboard. When the wall has no baseboard the back stop G will rest on top of the foot D.

The collar F should be installed as illustrated,—or reversed,—in accordance with instructions on opposite page.

HANGERS

Grinnell Adjustable Column Radiator Brackets

LIST PRICES

Brackets for Single, Two
or Three Column Radiators
Each \$2.50

DIMENSIONS

Number of Columns	C
Single Column	5 3/8
Two Column	6 5/8
Three Column	7 1/2

Clearance from Wall to
Back of Radiator is approxi-
mately 3-inches.

Fig. No. 189

For certain types and sizes of Column Radiators the Collar should be installed in a reverse position. This can be easily ascertained when installation is being made.

DIMENSIONS

Number of Columns	Height of Sections—Inches	Maximum A Inches	B Inches
Single, Two or Three	18, 19, 20	7 1/2	7
	22, 23	12 1/2	12
	25, 26	15 1/2	15
	31, 32, 37, 38	21 1/2	21
	45	30 1/2	30

INSTRUCTIONS FOR ORDERING

Order by Figure Number. Specify the make, type, height and number of columns of Radiator.

Note:—The 5/8-inch bolt and nut "B" are not included in the price of the bracket, and will have to be ordered separately.

HANGERS

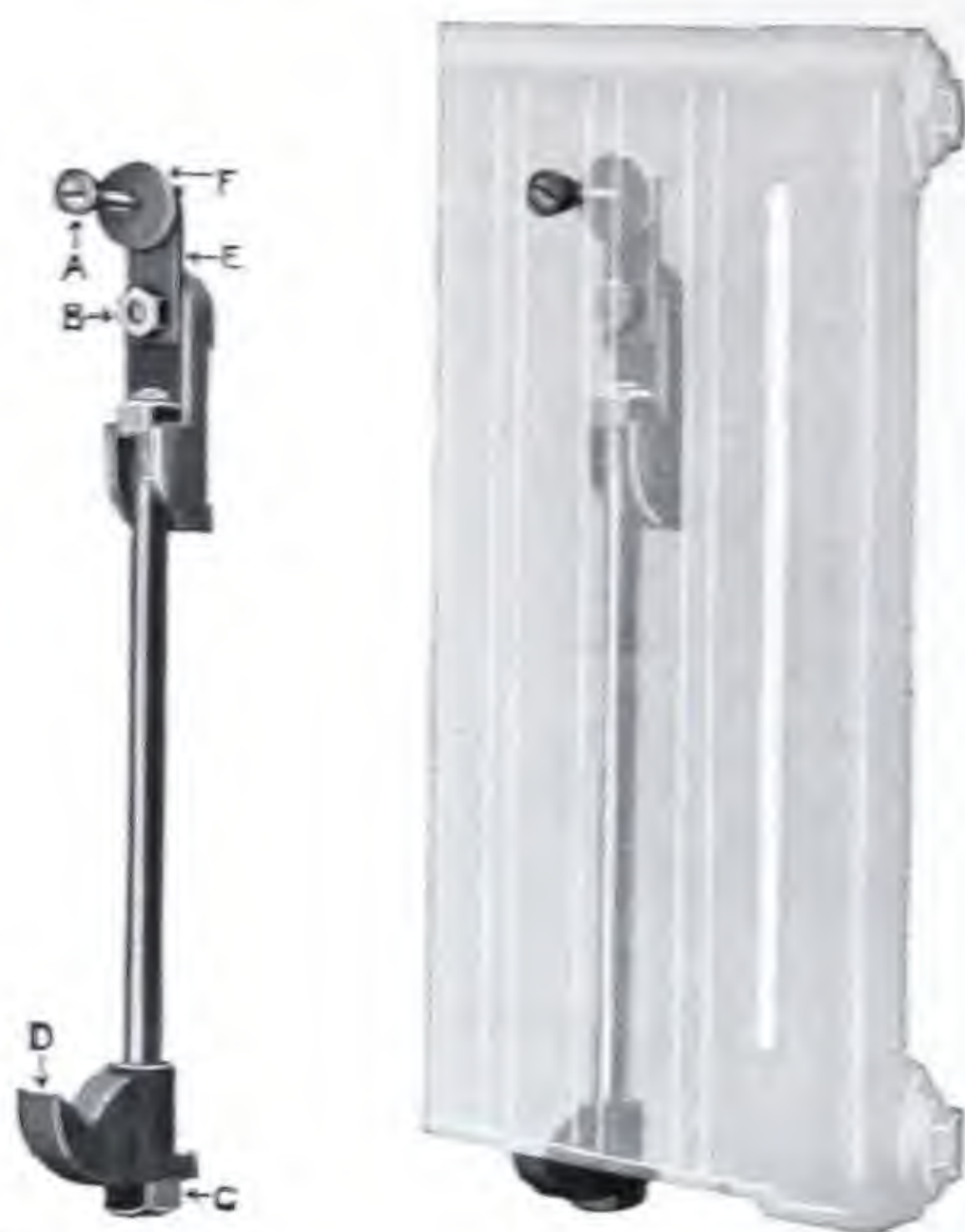
Grinnell Adjustable Wall Radiator Brackets

Fig. No. 190



Fig. No. 191

Grinnell Wall Radiator Brackets are designed to support a single tier of radiation or two tiers,—one in front of the other. Fig. No. 190 shows bracket with single foot D for supporting one tier,—Fig. No. 191 shows bracket with double foot H, long screw and double collar G for holding two tiers in place.

When installed the bracket is practically out of sight.

Low cost and minimum of labor in installation makes the Grinnell Adjustable Wall Radiator Bracket the most economical and practical device for use in supporting cast iron wall radiation. Only one bolt is necessary to securely fasten this bracket to the wall.

When hook bolt is used (see Sketches A and B) it can be set without extremely accurate measurements because there is a liberal adjustment of the bracket vertically by simply turning the bolt head C.

The screw A, in connection with extension piece E held in place by bolt B becomes adjustable and consequently will always strike between the bars of the radiator no matter where the bracket is placed.

When bolts and expansion cases are used for bolt B, the top of the radiator may be located at the window sill level, and yet the bolt B can be placed low enough in the brick walls to eliminate trouble with loosening of sills due to drilling of holes.

As only three points of the bracket touch the wall, the difficulty so often experienced with rough brick work is practically eliminated.

On account of their substantial character, cost of installation can be further reduced by spacing these hangers farther apart than ordinary types of lighter construction, especially where hook bolts are set in the wall.

For certain types and sizes of Wall Radiators the single collar F and double collar G should be installed in a reverse position.

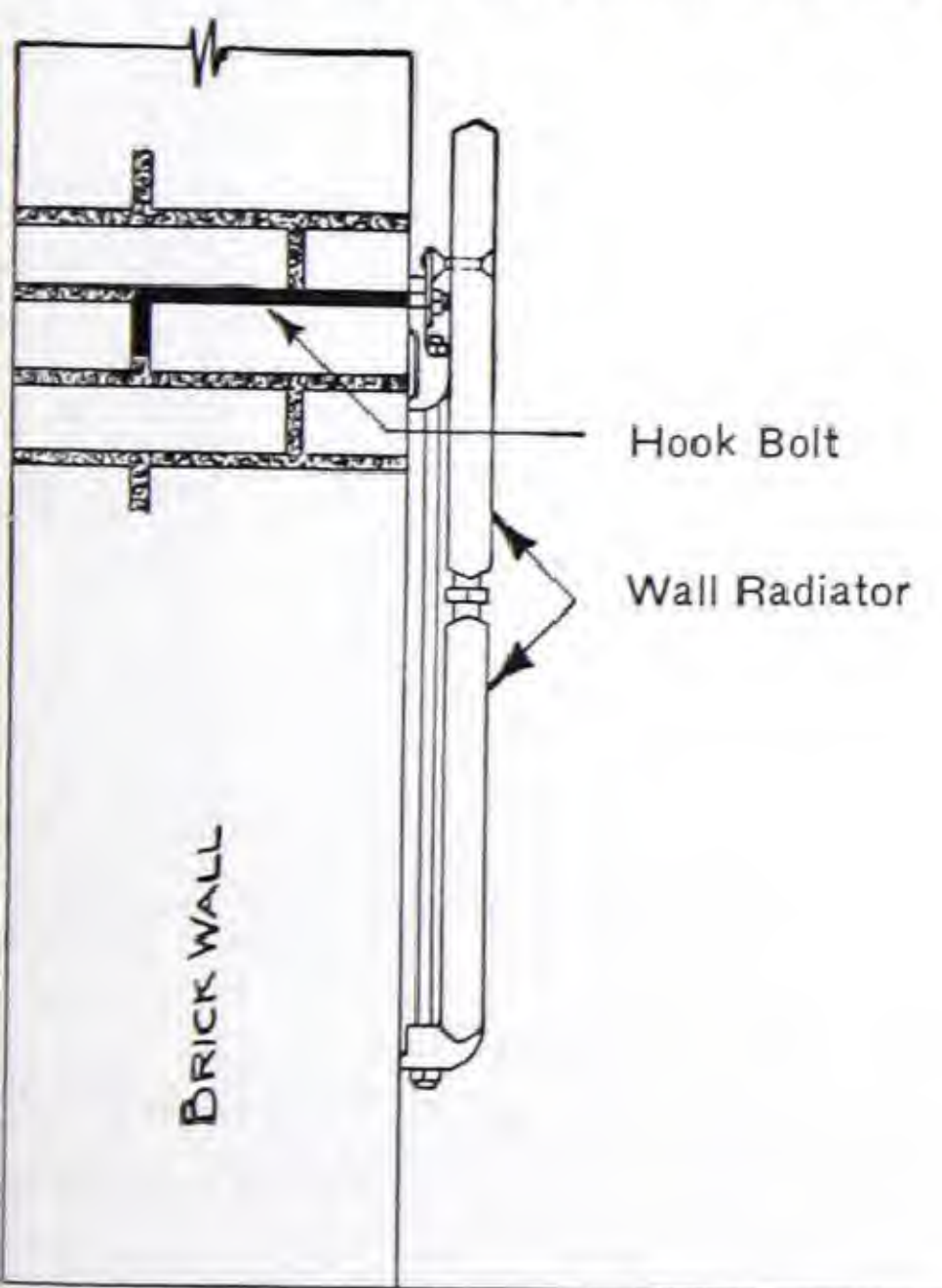
LIST PRICES

Fig. No. 190.....	\$2.50	Fig. No. 191.....	\$3.25
Dimensions on following page.			

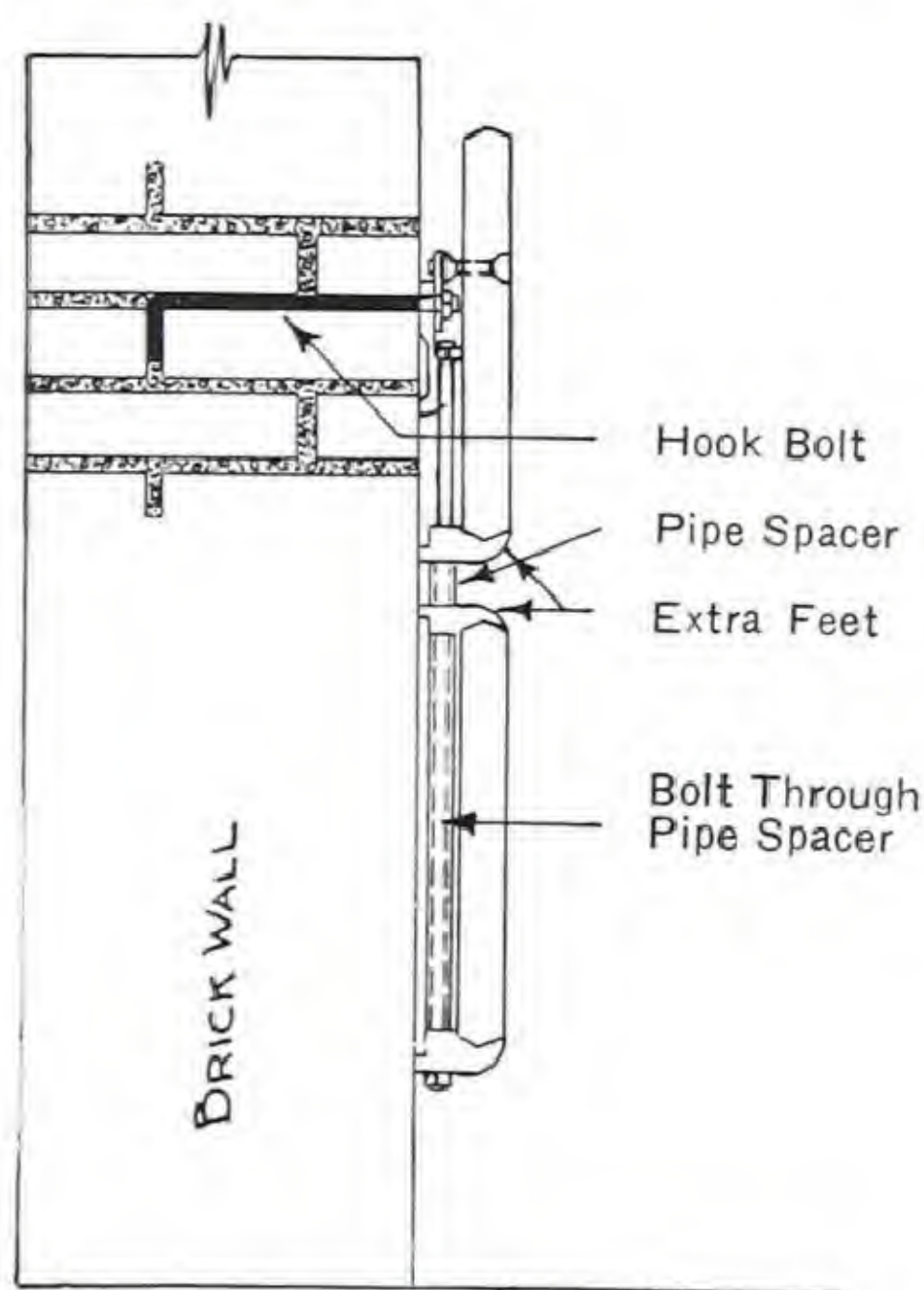
SPECIAL APPLICATIONS

One of the most valuable features is the fact that one Bracket, Fig. No. 190, may be used to support more than one tier of wall radiators, connected, simply by lengthening bolt "C." See sketch A.

Special applications are also possible for two tiers of wall radiators which are independently connected and not joined with nipples. See sketch B.



Sketch A



Sketch B

Details covering these special applications of the bracket will be furnished upon request.

HANGERS

Grinnell Adjustable Wall Radiator Brackets—(Continued)

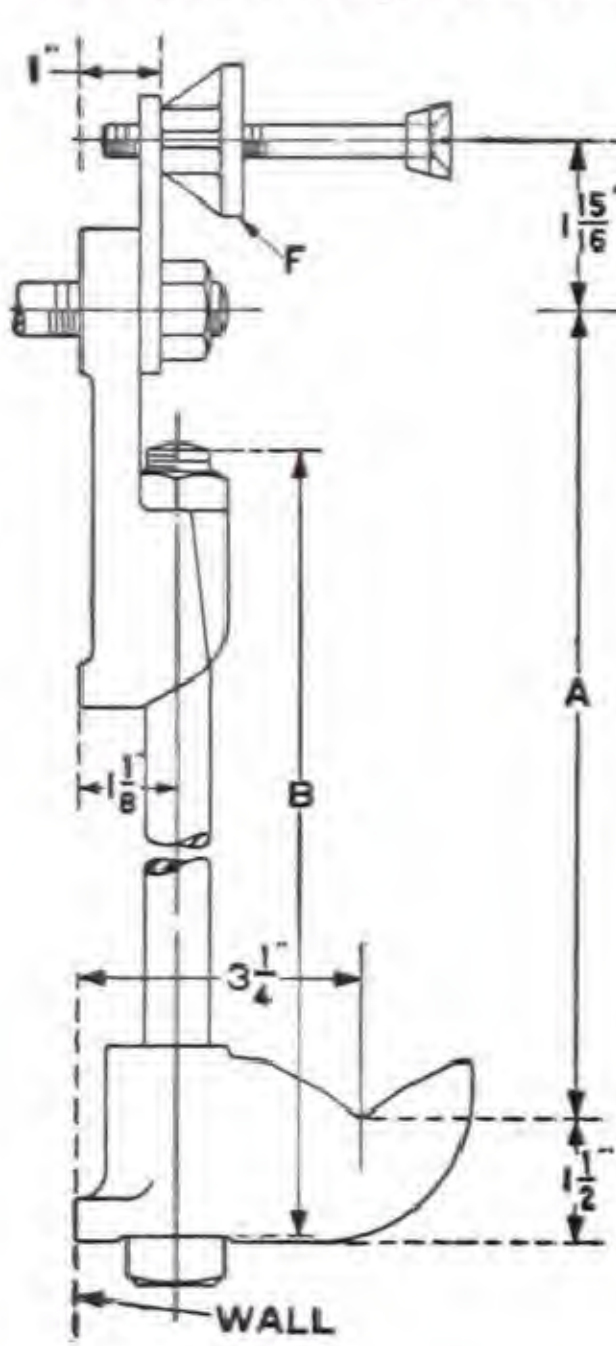


Fig. No. 190

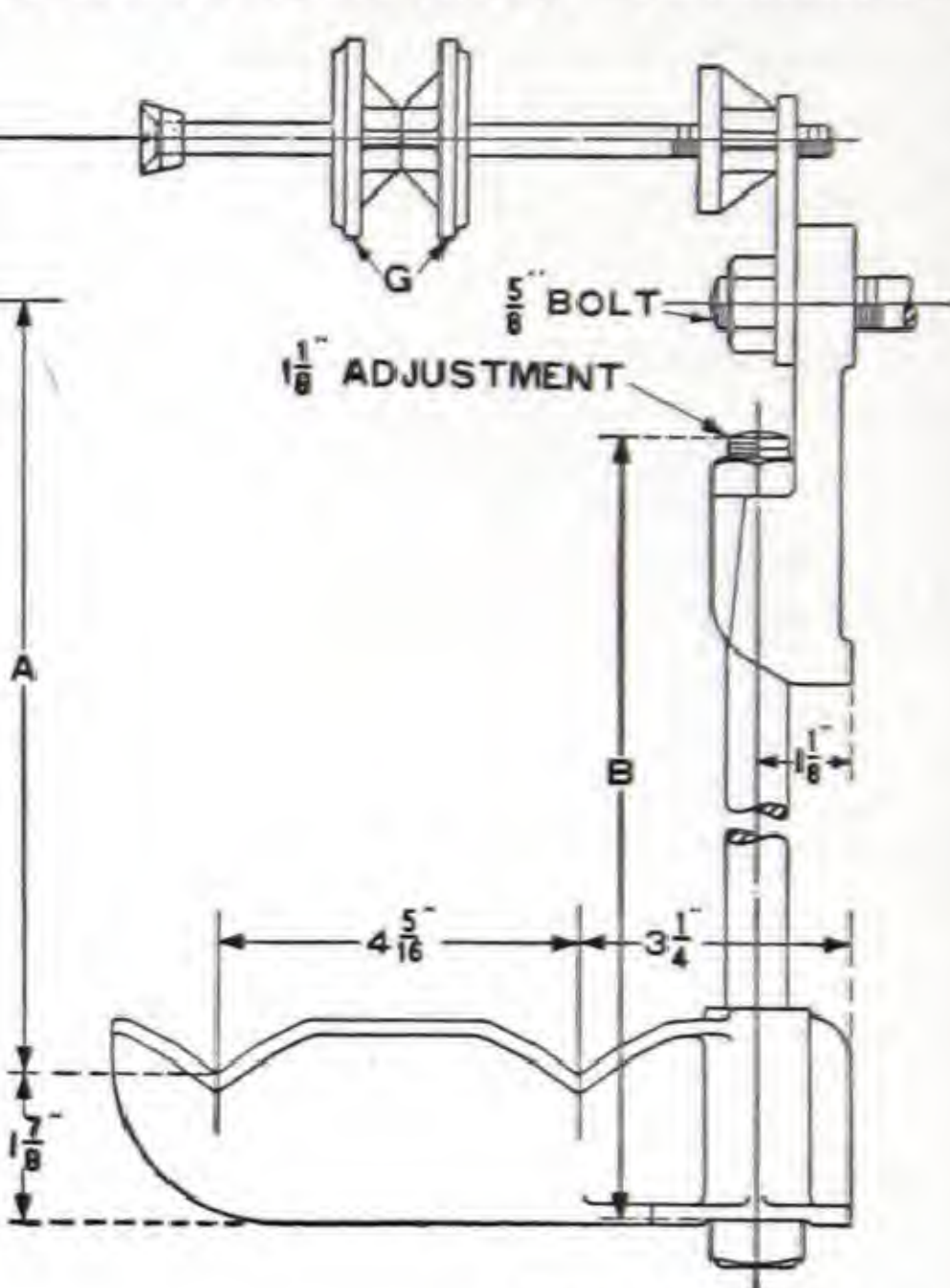


Fig. No. 191

NOTES: For certain types and sizes of Wall Radiators, the Single Collar F and the Double Collar G should be installed in reverse position. This can be easily ascertained when installation is being made.
Maximum Length "A" approximately equals Length "B."

LENGTH "B" OF 3/4-INCH BOLT

MAKE	TYPE	Size of Radiator—Sq. Ft. per Section					
		Horizontal All Sizes	Vertical				
			5	6	7	9	12
Dominion Radiator Co.....	Peerless	7"	....	....	15"	22"	....
	Standard	7"	....	....	15"	22"	....
	Ontario	7"	7"	15"	15"	17"	22"*
	Princess	7"	7"	15"	17"	17"	....
Pease Foundry Co.....	Economy	7"	....	....	15"	22"	....
Gurney Foundry Co.....	Gurney	7"	....	....	12"	17"	....
	Beaver	7"	....	....	15"	22"	....
Taylor Forbes Co.....	Empress	7"	....	7"	....	15"	22"*
	Victor	7"	....	....	15"	22"	....
Imperial Radiator Co.....	Imperial	7"	....	....	15"	22"*	22"*
	King	7"	7"	15"	17"	17"	....

Screw A (see page 420) is 4 1/2" long for all Radiators marked *. For other Radiators screw A is 4" long.

INSTRUCTIONS FOR ORDERING

Order by Figure Number. Specify the make, type and size of Wall Radiator. Also specify style, when Radiator is made in both Horizontal and Vertical styles.
Note:—The 5/8" wall bolt and nut are not included in the price of the bracket, and they will have to be ordered separately.
When Adjustable Wall Radiator Brackets are wanted to support more than one tier of radiators, as shown in Sketches A and B, furnish the information requested above, also number of tiers and whether as per Sketch A or Sketch B. When ordering as per Sketch A, state whether "Blind" or "Hex" nipples are used between tiers. When ordering as per sketch B, give distance between tiers.

HANGERS

*Grinnell Adjustable Wall Coil Hangers**Cast Iron Brackets**Pressed Steel Plates*

Adjustable Wall Coil Hangers are furnished with four separate brackets,—two for single coils and two for double coils as follows:

Figure No. 160—Single Coil— $2\frac{1}{4}$ " Wall to Center Line of Coil.

Figure No. 161—Single Coil— $6\frac{1}{4}$ " Wall to Center Line of Coil.

Figure No. 162—Double Coil— $2\frac{1}{4}$ " Wall to Center Line of First Coil.

Figure No. 163—Double Coil— $6\frac{1}{4}$ " Wall to Center Line of First Coil.

Brackets for double coils place the second coil $3\frac{1}{2}$ " center to center in front of first coil.

The Hangers with the short brackets, Figures No. 160 and 162, are usually used on flush or straight walls. Those with long brackets, Figures No. 161 and 163, are used on walls with pilasters 4" deep, allowing the coils to run straight past the pilasters. It is often desirable, however, to place alternate hangers on the pilasters, in which case the short brackets can be used on the pilasters and the long brackets on the walls.

The adjustable feature is the principal advantage of these hangers. By turning the adjusting nut A, hanger plate can be raised or lowered one inch or less so as to secure perfect alignment of piping and to make each hanger carry its own proportion of the total weight of the heating coil.

Fig. No.
160

Besides their adjustable advantages these hangers can be installed with great saving of labor. It is only necessary to fasten the individual bracket in place by two bolts. On brick or concrete construction one of the bolts, preferably the upper one, can be set in wall during construction or both may be set in wall if template is used.

Grinnell Wall Coil Hangers are all-metal hangers, a most desirable feature especially in buildings of fire resistant construction. The Adjustable Hanger Plates are made of steel, channel shaped and offer very little resistance to expansion.

The Adjustable Hanger Plate can be fastened to wood or steel framework of saw-tooth skylights, also to steel columns or struts of trusses when coils are placed vertically in overhead position. $\frac{1}{2}$ " Hook Bolts are used in supporting the plate from clamp or bracket.



HANGERS

Grinnell Adjustable Wall Coil Hangers (Continued)

LIST PRICES

No. of Branches	Adj. Wall Coil Hanger— Complete								Adj. Hanger Plate Only	
	Fig. No. 160		Fig. No. 161		Fig. No. 162		Fig. No. 163		Fig. No. 159	
	1¼" Pipe	1½" Pipe	1¼" Pipe	1½" Pipe	1¼" Pipe	1½" Pipe	1¼" Pipe	1½" Pipe	1¼" Pipe	1½" Pipe
4	2.00	2.10	2.35	2.45	2.60	2.85	4.55	4.75	.52	.60
5	2.10	2.20	2.45	2.55	2.85	3.00	4.75	5.00	.60	.72
6	2.20	2.30	2.55	2.70	3.00	3.30	5.00	5.30	.72	.88
7	2.30	2.40	2.75	2.85	3.40	3.55	5.35	5.50	.92	1.00
8	2.40	2.50	2.85	3.00	3.55	3.90	5.50	5.85	1.00	1.16
9	2.50	2.70	2.95	3.10	3.80	4.10	5.75	6.10	1.12	1.30
10	2.60	2.80	3.10	3.30	4.00	4.45	6.00	6.40	1.25	1.44
11	2.75	3.00	3.20	3.40	4.25	4.70	6.15	6.65	1.36	1.56
12	2.85	3.25	3.40	3.50	4.70	4.95	6.65	6.90	1.56	1.70

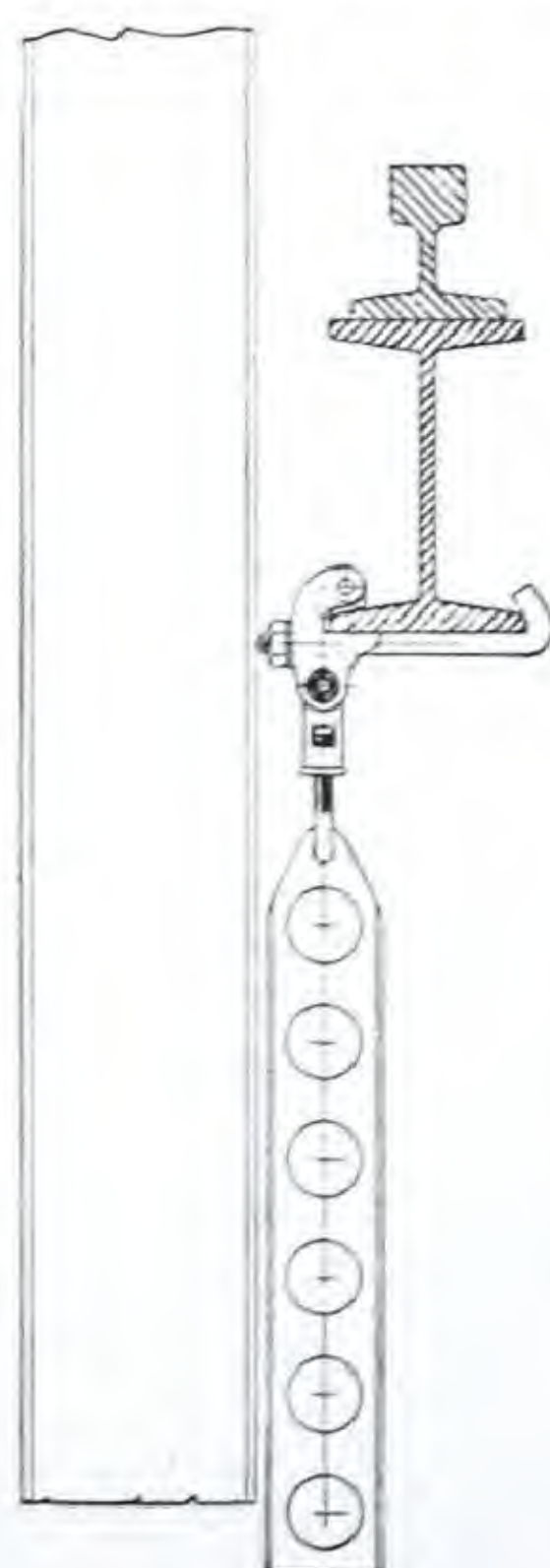


Fig. Y

Order by Figure Number.

Coil hung from Crane Rail Girder (left). Adjustable Hanger Plate used with Side I Beam Clamp and Extension Piece for attachment to Crane Rail Girder.

Coil hung from purlin (right). Adjustable Hanger Plate attached to roof purlin with Side Beam Bracket and Hanger Rod, providing the adjustment.



Fig. X

HANGERS

Adjustable Wall Coil Hangers

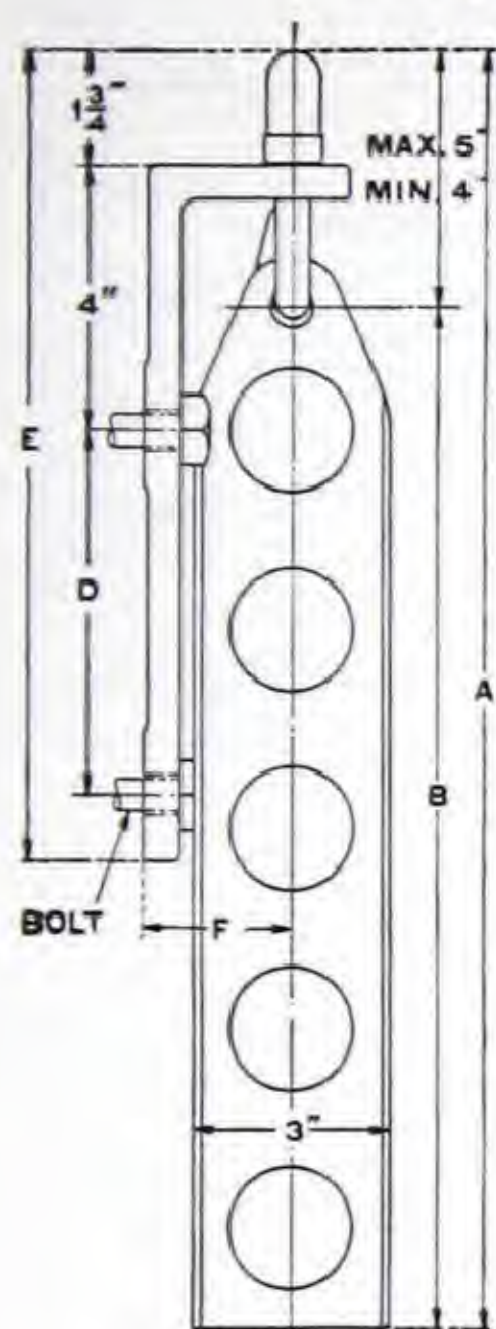


Fig. No. 160

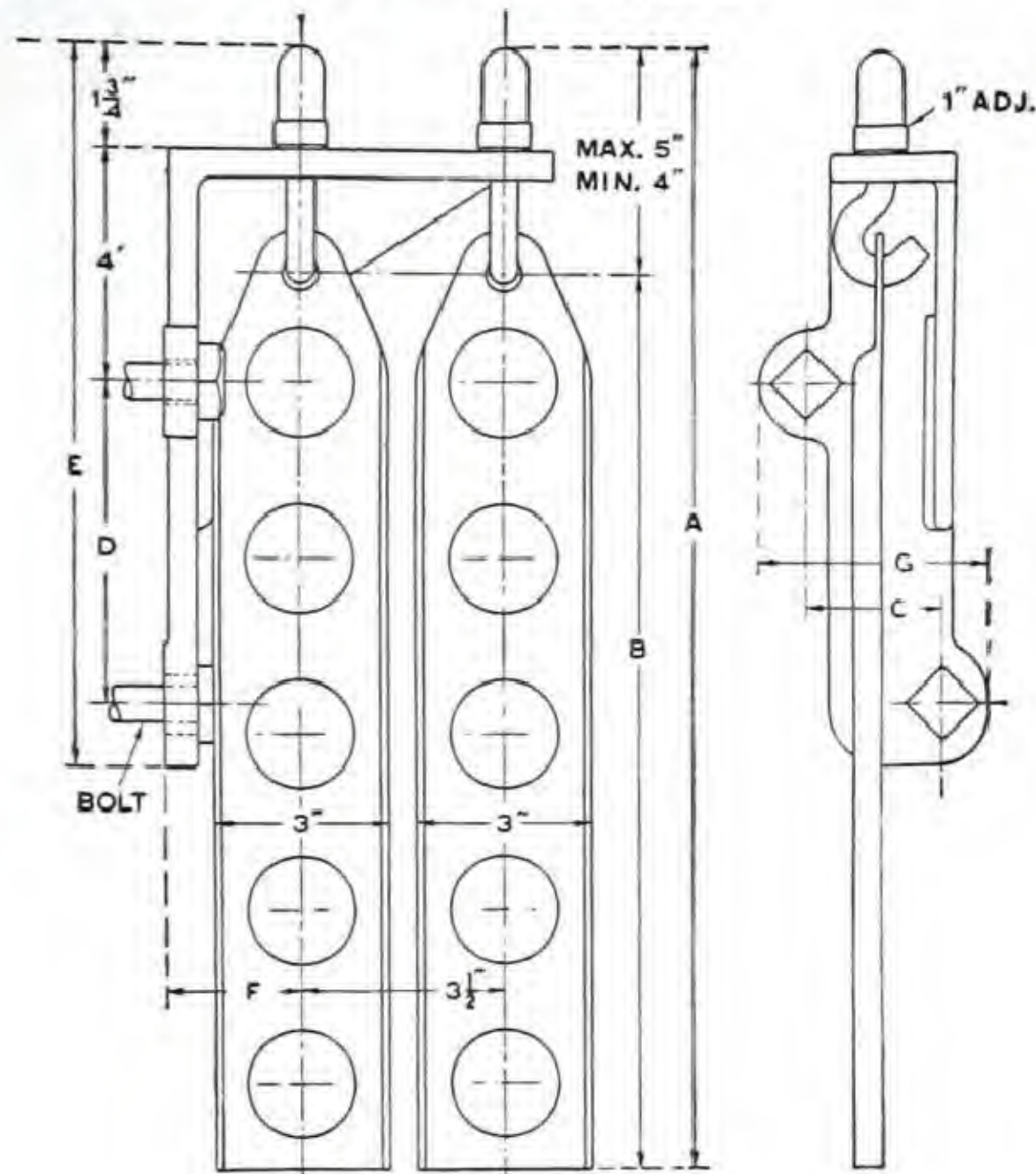


Fig. No. 162

DIMENSIONS—HANGER PLATES

Number of Branches	1 1/4" HANGER PLATES			1 1/2" HANGER PLATES		
	Dimensions			Dimensions		
	A		B	A		B
	Max.	Min.		Max.	Min.	
4	17 3/8	16 3/8	12 3/8	19 1/8	18 1/8	14 1/8
5	20 3/8	19 3/8	15 3/8	22 5/8	21 5/8	17 5/8
6	23 3/8	22 3/8	18 3/8	26 1/8	25 1/8	21 1/8
7	26 3/8	25 3/8	21 3/8	29 5/8	28 5/8	24 5/8
8	29 3/8	28 3/8	24 3/8	33 1/8	32 1/8	28 1/8
9	32 3/8	31 3/8	27 3/8	36 5/8	35 5/8	31 5/8
10	35 3/8	34 3/8	30 3/8	40 1/8	39 1/8	35 1/8
11	38 3/8	37 3/8	33 3/8	43 5/8	42 5/8	38 5/8
12	41 3/8	40 3/8	36 3/8	47 1/8	46 1/8	42 1/8

DIMENSIONS—BRACKETS

Fig. No.	C	D	E	F	G	Hook Bolts	Wall Bolts
160	2 1/4	5 1/2	12 1/4	2 1/4	3 3/4	1/2	1/2
161	0	9 1/2	16 1/2	6 1/4	2 3/8	1/2	5/8
162	2 3/8	5 1/2	12 1/4	2 1/4	3 3/4	1/2	5/8
163	0	9 1/2	16 1/2	6 1/4	2 3/8	1/2	5/8

Order by Figure Number.



Standard Type
Fig. No. 166

HANGERS

Grinnell Hook Plates

Standard and Expansion Types



Expansion Type
Fig. No. 167

LIST PRICES—Fig. Nos. 166, 167

Number of Branches	2	3	4	5	6
1 inch Hook Plates . . . . .	.18	.23	.26	.32	.38
1¼ inch Hook Plates . . . . .	.21	.27	.32	.41	.52
1½ inch Hook Plates . . . . .	.28	.43	.58	.72	.88
2 inch Hook Plates . . . . .	.43	.65	.90	1.15	1.35
1 inch Expansion Hook Plates . . . . .	.25	.35	.50	.60	.70
1¼ inch Expansion Hook Plates . . . . .	.27	.40	.60	.70	.80
1½ inch Expansion Hook Plates . . . . .	.40	.60	.75	.90	1.00
2 inch Expansion Hook Plates . . . . .	.60	.85	1.00	1.35	1.55

Grinnell Hook Plates, while cheaper than our Adjustable Wall Coil Hangers shown on preceding pages, have neither the strength nor adjustability of that product. The difference in price is in most cases more than offset by the installation cost.

Grinnell Expansion Hook Plates are designed for supporting wall coils in corners to provide for expansion whereas Hook Plates are used in the ordinary work.

Grinnell Hook Plates are listed up to six branch only, but when a greater number than six branches are required, order two plates of six branch or less. The following list shows how these combinations can best be made.

For 7 Branch plate use—one 3 branch and one 4 branch.

For 8 Branch plate use—two 4 branch.

For 9 Branch plate use—one 5 branch and one 4 branch.

For 10 Branch plate use—two 5 branch.

For 12 Branch plate use—two 6 branch.

HANGERS

Grinnell Hook Plates

Dimensions—Standard Type

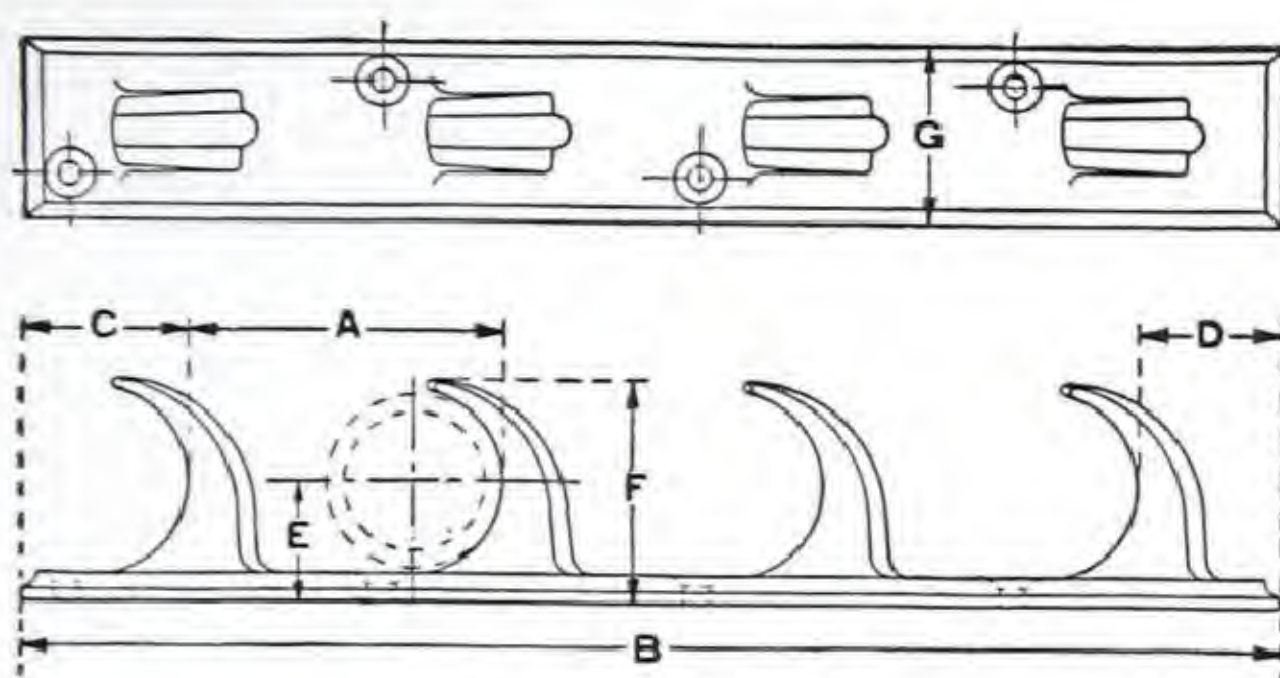


Fig. No. 166

NOTE: Use 1½" No. 18 Screws

No. Branch	Pipe Size	A	B	C	D	E	F	G	No. Screws
2	...	2½	5	1½	1	31/32	1 13/16	1¾	2
3	...	2½	7½	1½	1	31/32	1 13/16	1¾	3
4	1	2½	10	1½	1	31/32	1 13/16	1¾	4
5	...	2½	12½	1½	1	31/32	1 13/16	1¾	5
6	...	2½	15	1½	1	31/32	1 13/16	1¾	6
2	...	3	6	1 5/8	1 3/8	1 5/32	2 3/16	1 7/8	2
3	...	3	9	1 5/8	1 3/8	1 5/32	2 3/16	1 7/8	3
4	1¼	3	12	1 5/8	1 3/8	1 5/32	2 3/16	1 7/8	4
5	...	3	15	1 5/8	1 3/8	1 5/32	2 3/16	1 7/8	5
6	...	3	18	1 5/8	1 3/8	1 5/32	2 3/16	1 7/8	6
2	...	3½	7	1 7/8	1 5/8	1 11/32	2½	2	2
3	...	3½	10½	1 7/8	1 5/8	1 11/32	2½	2	3
4	1½	3½	14	1 7/8	1 5/8	1 11/32	2½	2	4
5	...	3½	17½	1 7/8	1 5/8	1 11/32	2½	2	5
6	...	3½	21	1 7/8	1 5/8	1 11/32	2½	2	6
2	...	4½	9	2½	2	1 5/8	3 1/8	2 3/8	2
3	...	4½	13½	2½	2	1 5/8	3 1/8	2 3/8	3
4	2	4½	18	2½	2	1 5/8	3 1/8	2 3/8	4
5	...	4½	22½	2½	2	1 5/8	3 1/8	2 3/8	5
6	...	4½	27	2½	2	1 5/8	3 1/8	2 3/8	6

Order by Figure Number.

HANGERS

Grinnell Hook Plates

Dimensions—Expansion Type

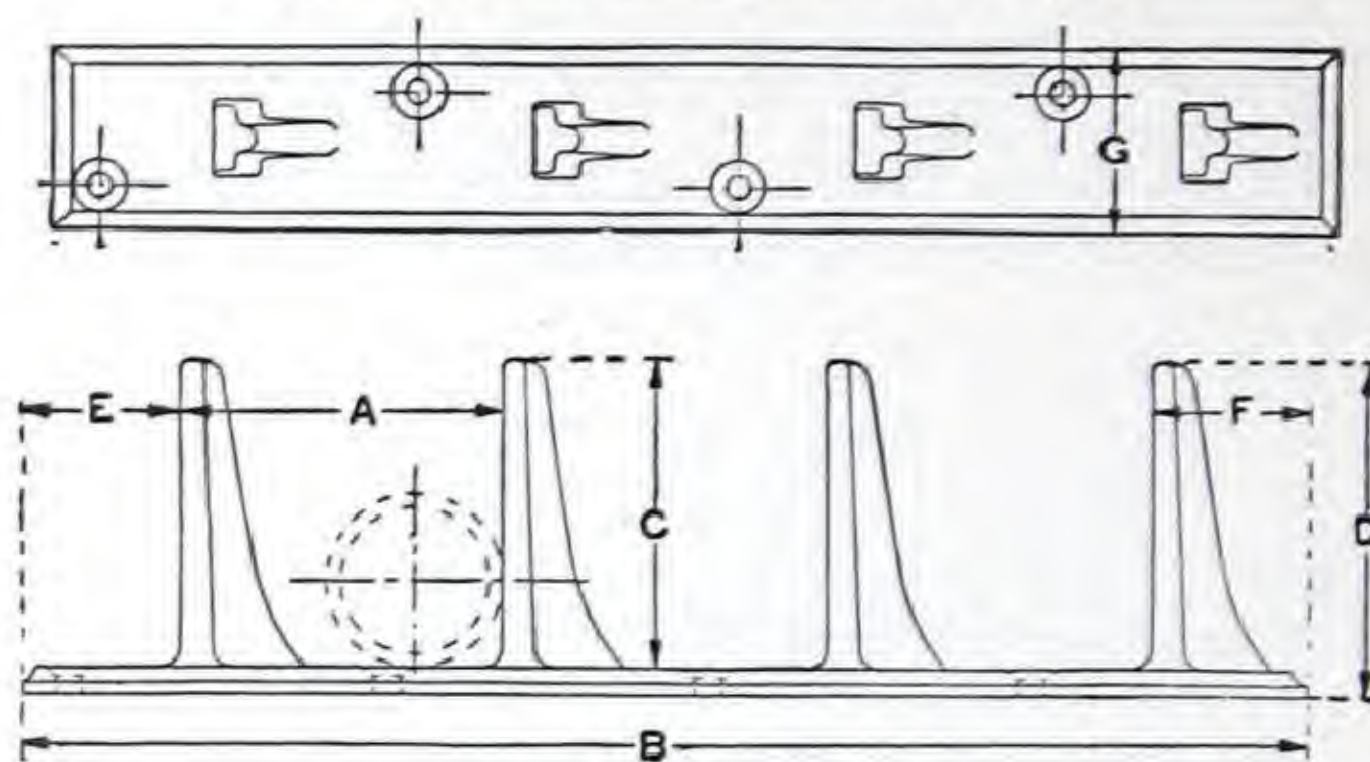


Fig. No. 167

NOTE: Use 1½" No. 18 Screws

No. Branch	Pipe Size	A	B	C	D	E	F	G	No. Screws
2	...	2½	5	2¾	3	1¼	1¼	1¾	2
3	...	2½	7½	2¾	3	1¼	1¼	1¾	3
4	1	2½	10	2¾	3	1¼	1¼	1¾	4
5	...	2½	12½	2¾	3	1¼	1¼	1¾	5
6	...	2½	15	2¾	3	1¼	1¼	1¾	6
2	...	3	6	3¼	3½	1¼	1¾	1⅞	2
3	...	3	9	3¼	3½	1¼	1¾	1⅞	3
4	1¼	3	12	3¼	3½	1¼	1¾	1⅞	4
5	...	3	15	3¼	3½	1¼	1¾	1⅞	5
6	...	3	18	3¼	3½	1¼	1¾	1⅞	6
2	...	3½	7	3⅞	3¾	1¾	1¾	2	2
3	...	3½	10½	3⅞	3¾	1¾	1¾	2	3
4	1½	3½	14	3⅞	3¾	1¾	1¾	2	4
5	...	3½	17½	3⅞	3¾	1¾	1¾	2	5
6	...	3½	21	3⅞	3¾	1¾	1¾	2	6
2	...	4½	9	3⅞	4	2⅞	2⅞	2⅞	2
3	...	4½	13½	3⅞	4	2⅞	2⅞	2⅞	3
4	2	4½	18	3⅞	4	2⅞	2⅞	2⅞	4
5	...	4½	22½	3⅞	4	2⅞	2⅞	2⅞	5
6	...	4½	27	3⅞	4	2⅞	2⅞	2⅞	6

Order by Figure Number.

HANGERS

Grinnell Single Hooks

Cast Iron

Single Hook
Fig. No. 168

For supporting pipe $\frac{1}{2}$ " to 3", this single hook has two distinct advantages,—strength and neatness of appearance when installed. It is used mainly from side of beams where no adjustment is necessary, and in cases where there is no expansion or contraction.

They are applied directly to beams with wood or coach screws.

They are useful for hanging small lines from walls, such as heating return mains, gas, water lines, etc. When put to such use, they are attached to wooden block fastened to wall.

The sketch (Fig. A) illustrates how the single hooks are used in conjunction with hook plate carrying wall. Note that hook plate and single hook in this sketch are shown screwed to wood block. Wood block is affixed to wall with bolts and expansion cases.

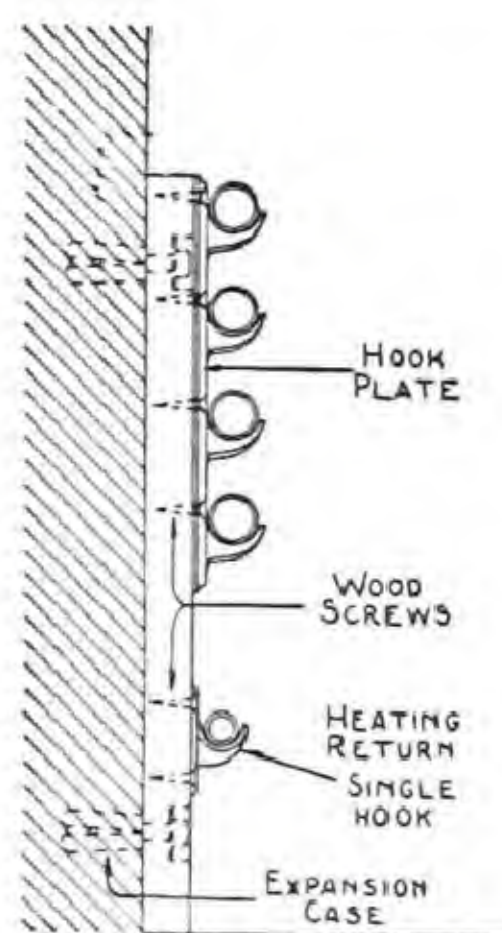
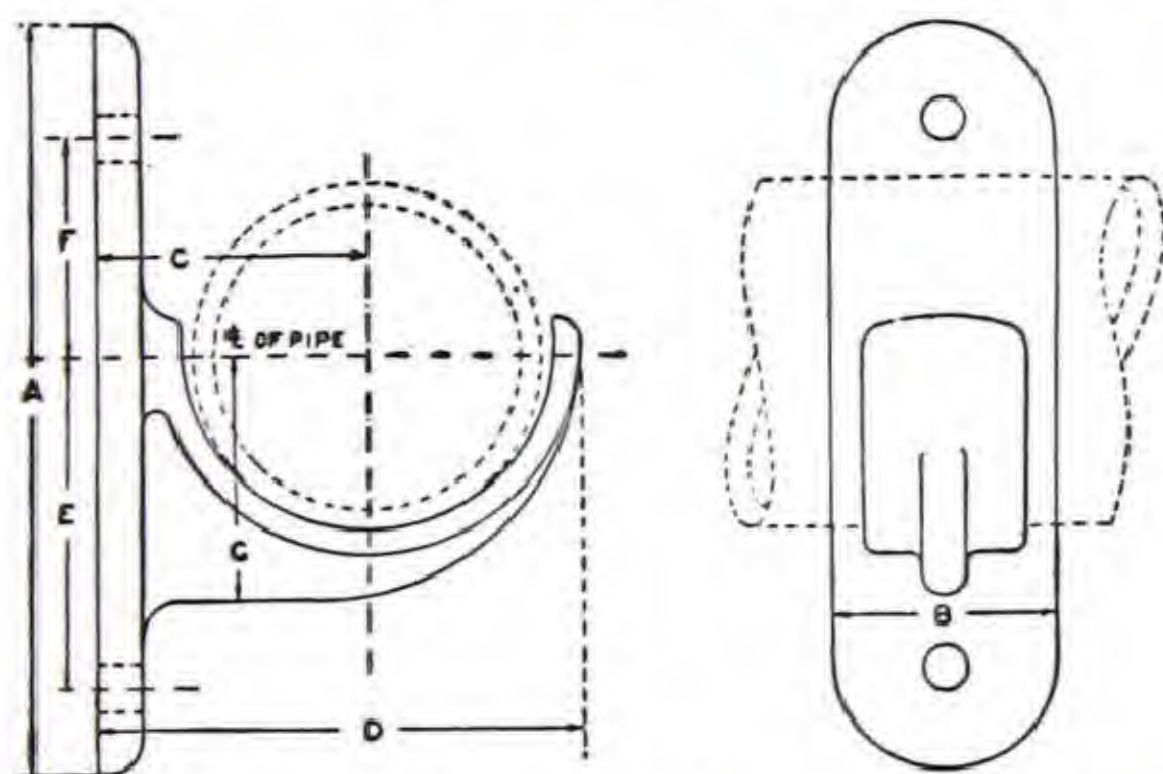


Fig. A



LIST PRICES AND DIMENSIONS

Pipe Size	Price Each	A	B	C	D	E	F	G	Size Screws
$\frac{1}{2}$	.08	$2\frac{11}{16}$	$\frac{15}{16}$	$\frac{23}{32}$	$1\frac{5}{16}$	$1\frac{7}{8}$	$\frac{5}{8}$	$\frac{25}{32}$	No. 14
$\frac{3}{4}$	.08	$3\frac{1}{16}$	1	$\frac{27}{32}$	$1\frac{9}{16}$	$1\frac{3}{4}$	$\frac{23}{32}$	$\frac{31}{32}$	No. 14
1	.09	$3\frac{1}{2}$	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{3}{8}$	$1\frac{5}{8}$	$\frac{13}{16}$	$1\frac{3}{16}$	No. 14
$1\frac{1}{4}$	.10	$4\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{3}{8}$	$2\frac{5}{16}$	$1\frac{15}{16}$	$1\frac{1}{16}$	$1\frac{3}{8}$	No. 18
$1\frac{1}{2}$	.15	$4\frac{9}{16}$	$1\frac{3}{8}$	$1\frac{3}{8}$	$2\frac{1}{2}$	$2\frac{1}{8}$	$1\frac{3}{16}$	$1\frac{17}{32}$	No. 18
2	.22	$5\frac{1}{2}$	$1\frac{5}{8}$	$1\frac{3}{2}$	$3\frac{1}{8}$	$2\frac{3}{2}$	$1\frac{3}{2}$	$1\frac{3}{2}$	No. 18
$2\frac{1}{2}$	.35	$6\frac{5}{8}$	2	$2\frac{5}{16}$	$4\frac{1}{8}$	$3\frac{1}{16}$	$1\frac{3}{4}$	$2\frac{3}{16}$	$\frac{3}{8}$
3	.50	$7\frac{1}{2}$	$2\frac{1}{4}$	$2\frac{11}{16}$	$4\frac{13}{16}$	$3\frac{7}{16}$	$2\frac{1}{16}$	$2\frac{9}{16}$	$\frac{3}{8}$

Order by Figure Number.

HANGERS

Grinnell Ring Plates

Standard and Expansion Types

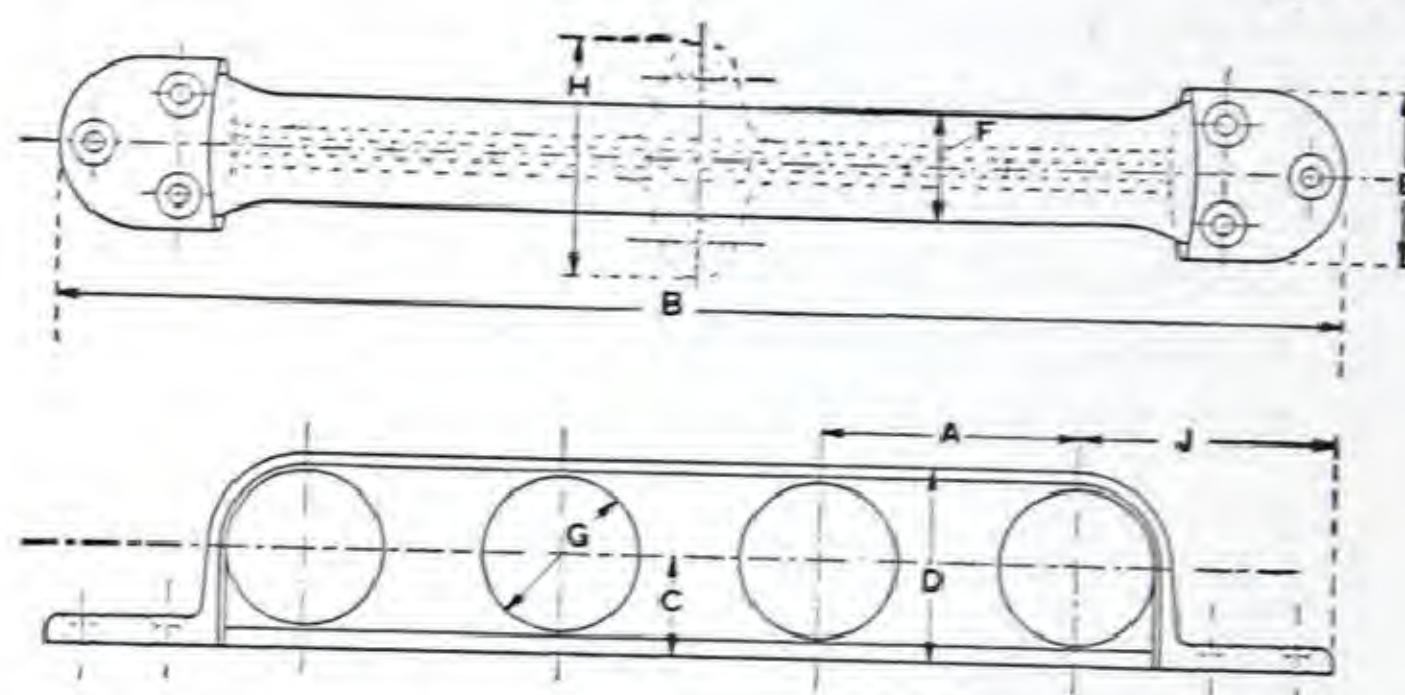
Cast Iron



Standard Type
Fig. No. 164



Expansion Type
Fig. No. 165



Note: Lugs midway between ends on 2"-8 branch and over.
1 1/2"-9 branch and over. 1 1/4"-12-16 branch. 18 branch
has 4 lugs.

Use 1 1/2" No. 18 Screws

LIST PRICES—DIMENSIONS—STANDARD TYPE—Fig. No. 164

No. Branch	Pipe Size	Price Each	A	B	C	D	E	F	G	H	J	No. Screws
1	1 1/4	.21	...	6	1 1/4	2 1/2	2 1/8	1 1/2	1 7/8	...	3	6
	1 1/2	.25	...	6	1 11/16	3 1/8	2	1 1/2	2 1/8	...	3	6
2	1 1/4	.35	3	9	1 1/4	2 1/2	2 1/8	1 1/2	1 7/8	...	3	6
	1 1/2	.45	3 1/2	10 1/2	1 3/8	2 11/16	2 3/8	1 1/2	2 1/8	...	3 1/2	6
3	1	.41	2 1/2	10	1 1/8	2 1/8	1 7/8	1 1/4	1 1/2	...	2 1/2	6
	1 1/4	.50	3	12	1 1/4	2 1/2	2 1/8	1 1/2	1 7/8	...	3	6
	1 1/2	.60	3 1/2	14	1 3/8	2 11/16	2 3/8	1 1/2	2 1/8	...	3 1/2	6
4	1	.50	2 1/2	12 1/2	1 1/8	2 1/8	1 7/8	1 1/4	1 1/2	...	2 1/2	6
	1 1/4	.62	3	15	1 1/4	2 1/2	2 1/8	1 1/2	1 7/8	...	3	6
	1 1/2	.72	3 1/2	17 1/2	1 3/8	2 11/16	2 3/8	1 1/2	2 1/8	...	3 1/2	6

Order by Figure Number.

HANGERS

Grinnell Ring Plates

LIST PRICES AND DIMENSIONS—STANDARD TYPE

Fig. No. 164—(Continued)

No. Branch	Pipe Size	Price Each	A	B	C	D	E	F	G	H	J	No. Screws
5	1	.62	2½	15	1⅛	2⅛	1⅞	1¼	1½	...	2½	6
	1¼	.75	3	18	1¼	2½	2⅛	1½	1⅞	...	3	6
	1½	.90	3½	21	1⅜	2⅞	2⅜	1½	2⅛	...	3½	6
	2	1.05	4½	25⅝	1⅝	3⅜	2⅜	1½	2⅝	...	3⅜	6
6	1	.72	2½	17½	1⅛	2⅛	1⅞	1¼	1½	...	2½	6
	1¼	1.10	3	21	1¼	2½	2⅛	1½	1⅞	...	3	6
	1½	1.35	3½	24½	1⅜	2⅞	2⅜	1½	2⅛	...	3½	6
	2	1.55	4½	30⅛	1⅝	3⅜	2⅜	1½	2⅝	...	3⅜	6
7	1	.96	2½	20	1⅛	2⅛	1⅞	1¼	1½	...	2½	6
	1¼	1.25	3	24	1¼	2½	2⅛	1½	1⅞	...	3	6
	1½	1.55	3½	28	1⅜	2⅞	2⅜	1½	2⅛	...	3½	6
	2	1.90	4½	34⅝	1⅝	3⅜	2⅜	1½	2⅝	...	3⅜	6
8	1	1.00	2½	22½	1⅛	2⅛	1⅞	1¼	1½	...	2½	6
	1¼	1.40	3	27	1¼	2½	2⅛	1½	1⅞	...	3	6
	1½	1.65	3½	31½	1⅜	2⅞	2⅜	1½	2⅛	...	3½	6
	2	2.10	4½	39⅛	1⅝	3⅜	2⅜	1½	2⅝	2 9/16	3⅜	8
9	1¼	1.55	3	30	1¼	2½	2⅛	1½	1⅞	...	3	6
	1½	1.95	3½	35	1⅜	2⅞	2⅜	1½	2⅛	3¼	3½	8
10	1¼	1.75	3	33	1¼	2½	2⅛	1½	1⅞	...	3	6
	1½	2.15	3½	38½	1⅜	2⅞	2⅜	1½	2⅛	3¼	3½	8
	2	3.50	4½	48⅛	1⅝	3⅜	2⅜	1½	2⅝	2 9/16	3⅜	8
12	1¼	2.35	3	39	1¼	2½	2⅛	1½	1⅞	3⅜	3	8
	1½	4.50	3½	45½	1⅜	2⅞	2⅜	1½	2⅛	3¼	3½	8
16	1¼	4.25	3	51	1¼	2½	2⅛	1½	1⅞	3⅜	3	8
18	1¼	6.00	3	57	1¼	2½	2⅛	1½	1⅞	3⅜	3	10

Although we do not recommend these Ring Plates for general use there are cases where they can be used to advantage.

For general use, the Adjustable Wall Coil Hanger shown on pages 423 to 425 is preferable,—the adjustable features of that hanger making it a practical and adaptable device for hanging coils.

When heating circulation is to be installed in saw-tooth monitor or from crane rail, Adjustable Hanger Plate should be used as shown on page 424, Illustrations X and Y.

Order by Figure Number.

HANGERS

Grinnell Ring Plates

Expansion Type

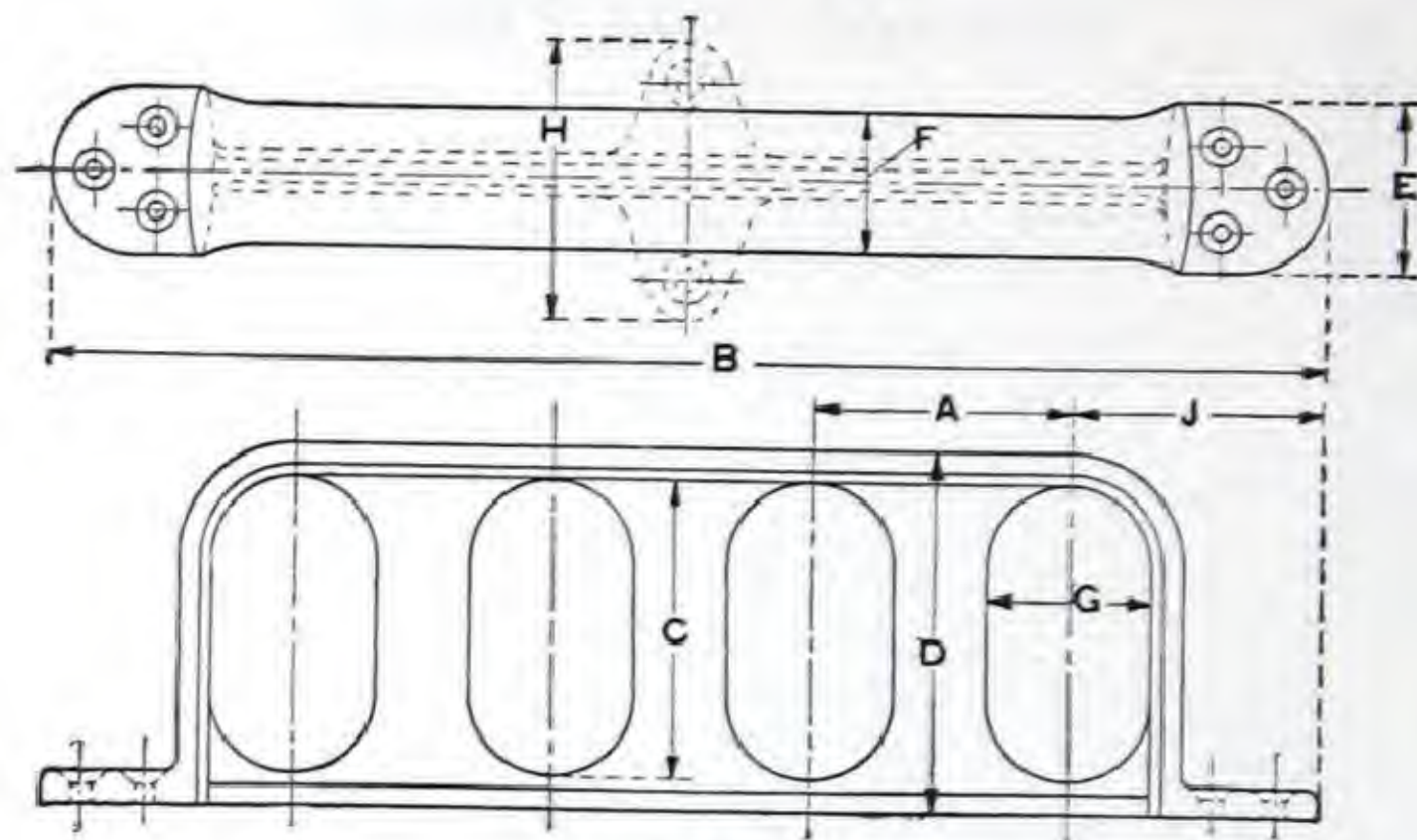


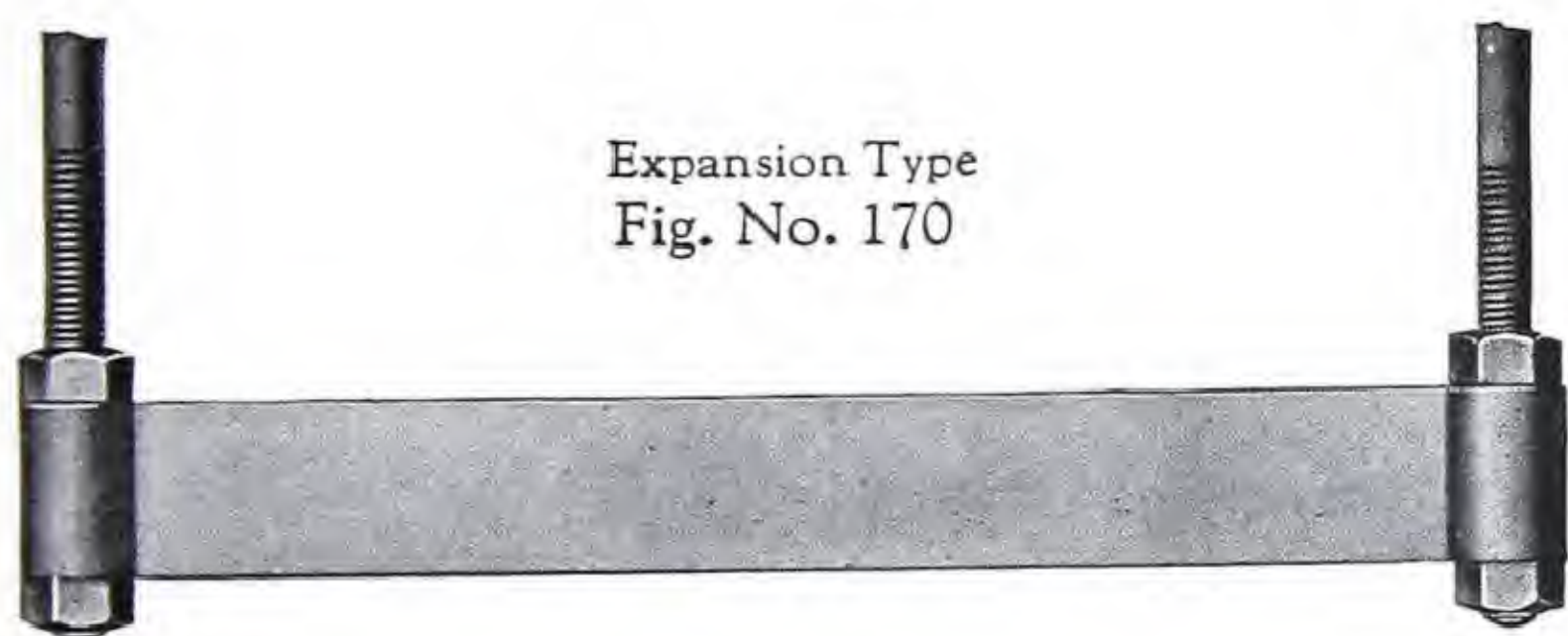
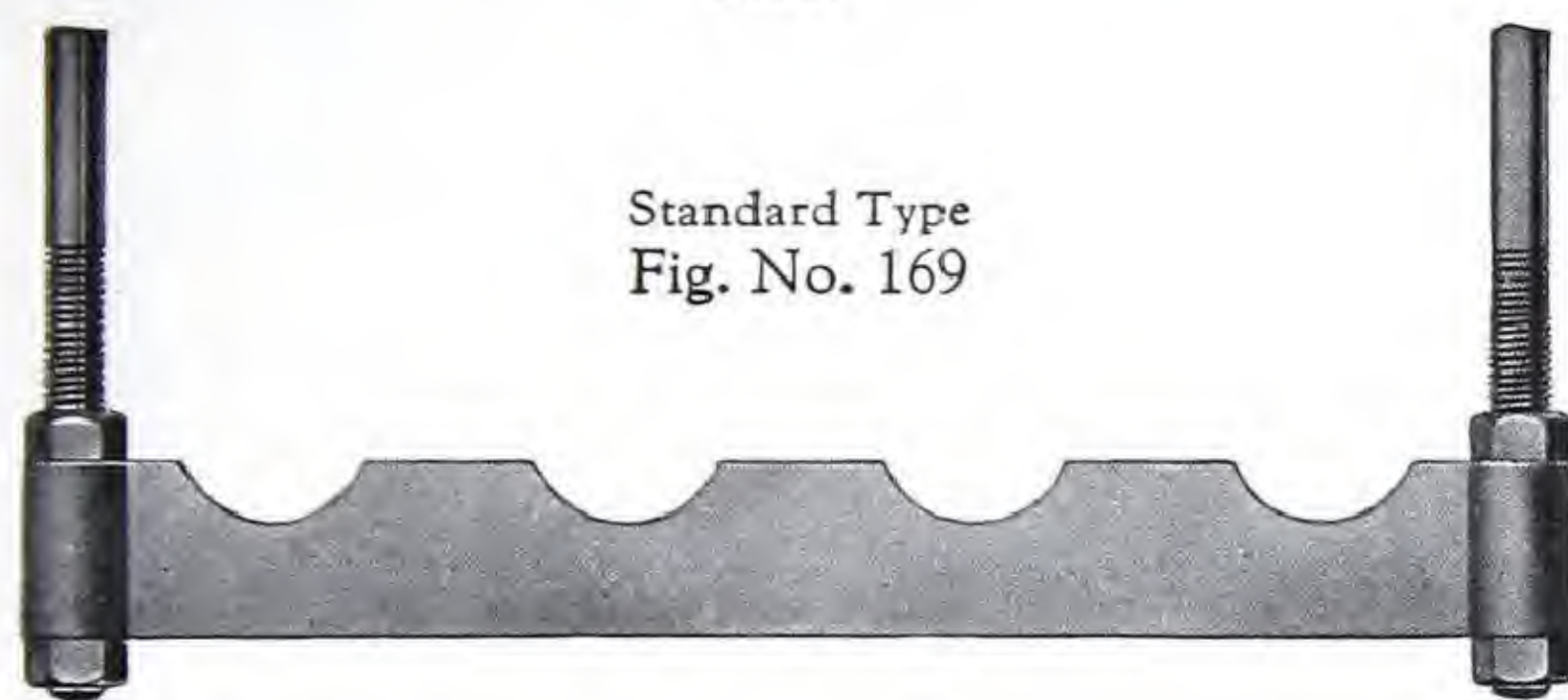
Fig. No. 165

Note: Lugs midway between ends on $1\frac{1}{4}$ " 12-16 branch.
18 Branch has 4 lugs. Use $1\frac{1}{2}$ " No. 18 Screws.

No. Branch	Pipe Size	Price Each	A	B	C	D	E	F	G	H	J	No. Screws
2	$1\frac{1}{4}$	.40	3	$8\frac{7}{8}$	$3\frac{1}{2}$	$4\frac{1}{8}$	2	$1\frac{11}{16}$	$1\frac{7}{8}$	...	$2\frac{5}{16}$	6
	$1\frac{1}{2}$	.50	$3\frac{1}{2}$	$10\frac{1}{2}$	$4\frac{1}{8}$	$4\frac{7}{8}$	$2\frac{3}{8}$	$1\frac{1}{2}$	$2\frac{1}{8}$	...	$3\frac{1}{2}$	6
3	$1\frac{1}{4}$	.60	3	$11\frac{1}{2}$	$3\frac{1}{2}$	$4\frac{1}{8}$	2	$1\frac{1}{2}$	$1\frac{7}{8}$	...	$2\frac{3}{4}$	6
	$1\frac{1}{2}$	.70	$3\frac{1}{2}$	14	$4\frac{1}{8}$	$4\frac{7}{8}$	$2\frac{3}{8}$	$1\frac{1}{2}$	$2\frac{1}{8}$	...	$3\frac{1}{2}$	6
4	$1\frac{1}{4}$	.75	3	$14\frac{7}{8}$	$3\frac{1}{2}$	$4\frac{1}{8}$	2	$1\frac{11}{16}$	$1\frac{7}{8}$	...	$2\frac{5}{16}$	6
	$1\frac{1}{2}$	.85	$3\frac{1}{2}$	$17\frac{1}{2}$	$4\frac{1}{8}$	$4\frac{7}{8}$	$2\frac{3}{8}$	$1\frac{1}{2}$	$2\frac{1}{8}$	...	$3\frac{1}{2}$	6
5	$1\frac{1}{4}$	.90	3	$17\frac{13}{16}$	$3\frac{1}{2}$	$4\frac{1}{8}$	2	$1\frac{5}{8}$	$1\frac{7}{8}$	...	$2\frac{9}{16}$	6
	$1\frac{1}{2}$	1.05	$3\frac{1}{2}$	21	$4\frac{1}{8}$	$4\frac{7}{8}$	$2\frac{3}{8}$	$1\frac{1}{2}$	$2\frac{1}{8}$	...	$3\frac{1}{2}$	6
6	$1\frac{1}{4}$	1.25	3	$20\frac{9}{16}$	$3\frac{1}{2}$	$4\frac{1}{8}$	2	$1\frac{11}{16}$	$1\frac{7}{8}$	...	$2\frac{5}{16}$	6
	$1\frac{1}{2}$	1.50	$3\frac{1}{2}$	$24\frac{1}{2}$	$4\frac{1}{8}$	$4\frac{7}{8}$	$2\frac{3}{8}$	$1\frac{1}{2}$	$2\frac{1}{8}$	...	$3\frac{1}{2}$	6
7	$1\frac{1}{4}$	1.50	3	$23\frac{7}{8}$	$3\frac{1}{2}$	$4\frac{1}{8}$	2	$1\frac{5}{8}$	$1\frac{7}{8}$	...	$2\frac{5}{16}$	6
	$1\frac{1}{2}$	1.80	$3\frac{1}{2}$	28	$4\frac{1}{8}$	$4\frac{7}{8}$	$2\frac{3}{8}$	$1\frac{1}{2}$	$2\frac{1}{8}$	...	$3\frac{1}{2}$	6
8	$1\frac{1}{4}$	1.70	3	$26\frac{7}{8}$	$3\frac{1}{2}$	$4\frac{1}{8}$	2	$1\frac{11}{16}$	$1\frac{7}{8}$	...	$2\frac{5}{16}$	6
9	$1\frac{1}{4}$	2.00	3	$29\frac{9}{16}$	$3\frac{1}{2}$	$4\frac{1}{8}$	2	$1\frac{5}{8}$	$1\frac{7}{8}$	...	$2\frac{3}{16}$	6
10	$1\frac{1}{4}$	2.50	3	$32\frac{11}{16}$	$3\frac{1}{2}$	$4\frac{1}{8}$	2	$1\frac{11}{16}$	$1\frac{7}{8}$	...	$2\frac{7}{16}$	6
12	$1\frac{1}{4}$	3.25	3	39	$3\frac{5}{8}$	$4\frac{1}{2}$	2	$1\frac{1}{2}$	$1\frac{7}{8}$	$3\frac{3}{8}$	3	8
16	$1\frac{1}{4}$	4.25	3	51	$3\frac{5}{8}$	$4\frac{7}{16}$	2	$1\frac{1}{2}$	$1\frac{7}{8}$	$3\frac{3}{8}$	3	8
18	$1\frac{1}{4}$	6.00	3	57	$3\frac{9}{16}$	$4\frac{7}{16}$	2	$1\frac{1}{2}$	$1\frac{7}{8}$	$3\frac{3}{8}$	3	10

Order by Figure Number.

HANGERS

*Grinnell Saddle Hangers**Steel*

Grinnell Saddle Hangers are made of steel instead of cast iron. The steel bar is shaped at both ends to take the hanger rods. Hex nuts at bottom of rods support the hanger and allow vertical adjustment by turning nuts to right or left.

The standard type of Grinnell Saddle Hanger has recesses punched out for holding the pipe. The expansion type is a plain steel bar for use at corners of coils to take care of sidewise movement due to expansion.

The Saddle Hanger is used in connection with $\frac{1}{2}$ -inch rods and hex nuts on 2 to 8 branch hangers, $\frac{5}{8}$ -inch rods and hex nuts on 9 to 12 branch hangers,—and with Expansion Cases, Grinnell Hanger Flanges, Side I Beam Clamps, etc., for supporting overhead coils.

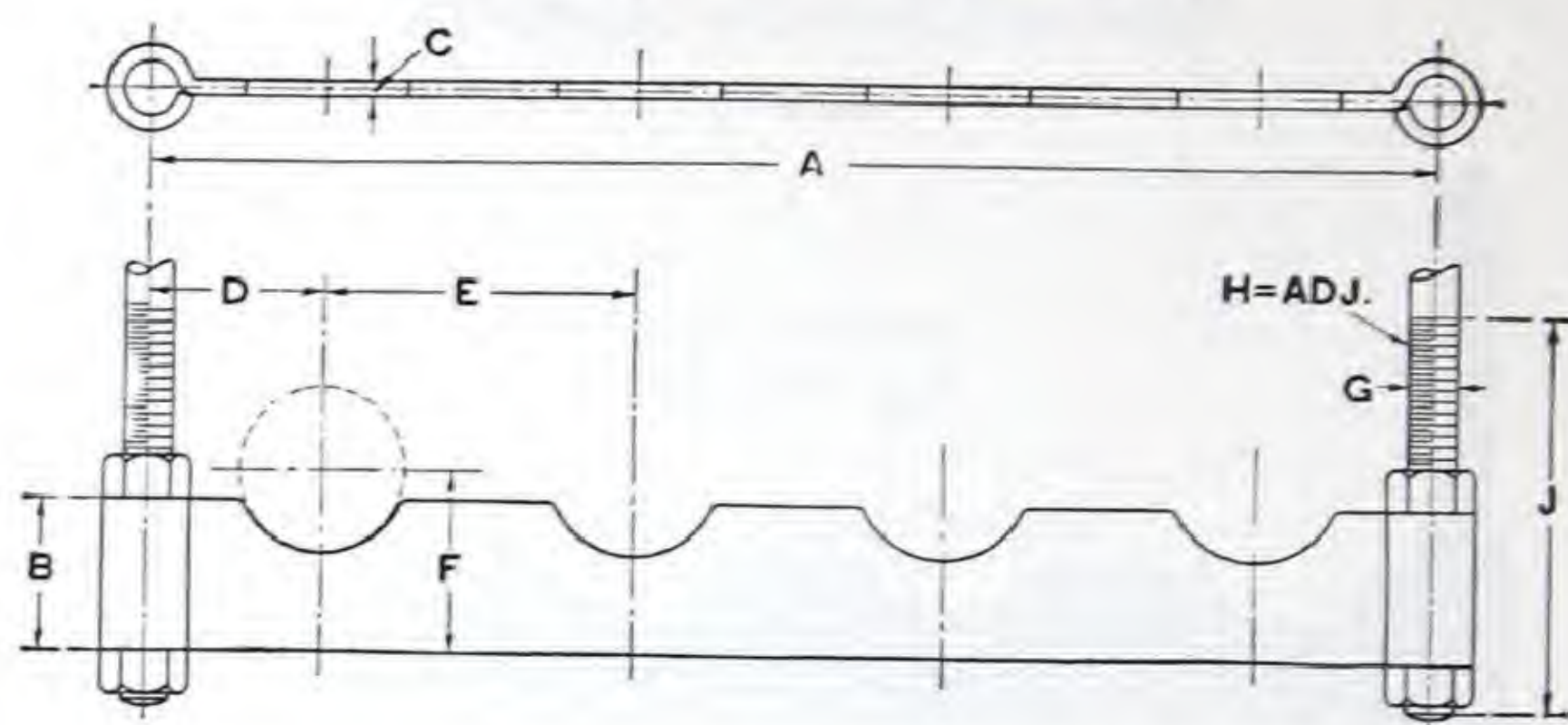
These Saddle Hangers are exceptionally strong and will not sag. Labor cost of installation is considerably less than with Branch Rolls and Rods.

Note: Order separately, the Hanger Rods and nuts, giving diameter, length, and length of thread at each end of rod.

List Prices and Dimensions on following pages.

HANGERS

Grinnell Saddle Hangers



Standard Type—Fig. No. 169

LIST PRICES AND DIMENSIONS

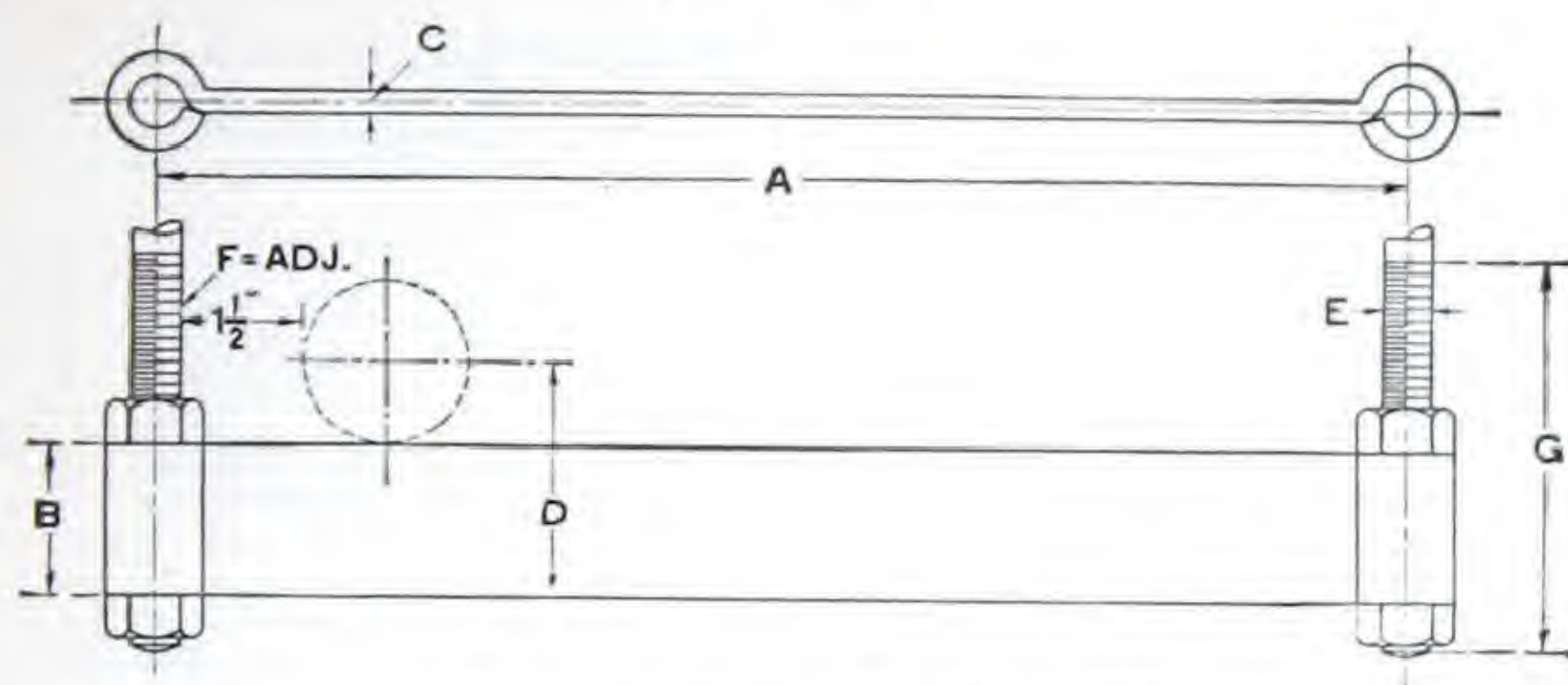
Pipe Size	Number of Branches	Price Each	A	B	C	D	E	F	G	H	J
1	2	\$0.20	6	1 1/2	3/16	1 3/4	2 1/2	1 11/16	1/2	2 1/2	5
	3	.25	8 1/2	"	"	"	"	"	"	"	"
	4	.30	11	"	"	"	"	"	"	"	"
	5	.35	13 1/2	"	"	"	"	"	"	"	"
	6	.40	16	"	"	"	"	"	"	"	"
	7	.45	18 1/2	1 3/4	1/4	"	"	1 15/16	"	2 1/4	"
	8	.55	21	"	"	"	"	"	"	"	"
	9	.60	23 1/2	"	"	"	"	"	5/8	2 3/4	5 3/4
	10	.65	26	"	"	"	"	"	"	"	"
	12	.80	31	"	"	"	"	"	"	"	"
1 1/4	2	.25	6 3/4	1 3/4	3/16	1 7/8	3	2	1/2	2 1/4	5
	3	.30	9 3/4	"	"	"	"	"	"	"	"
	4	.35	12 3/4	"	"	"	"	"	"	"	"
	5	.40	15 3/4	"	"	"	"	"	"	"	"
	6	.45	18 3/4	"	"	"	"	"	"	"	"
	7	.50	21 3/4	2	1/4	"	"	2 1/4	"	2	"
	8	.60	24 3/4	"	"	"	"	"	"	"	"
	9	.75	27 3/4	"	"	"	"	"	5/8	2 1/2	5 3/4
	10	.90	30 3/4	"	"	"	"	"	"	"	"
	12	1.20	36 3/4	"	"	"	"	"	"	"	"

List Prices do not include hanger rods and nuts.
Order by Figure Number.

HANGERS

Grinnell Saddle Hangers

(Continued)



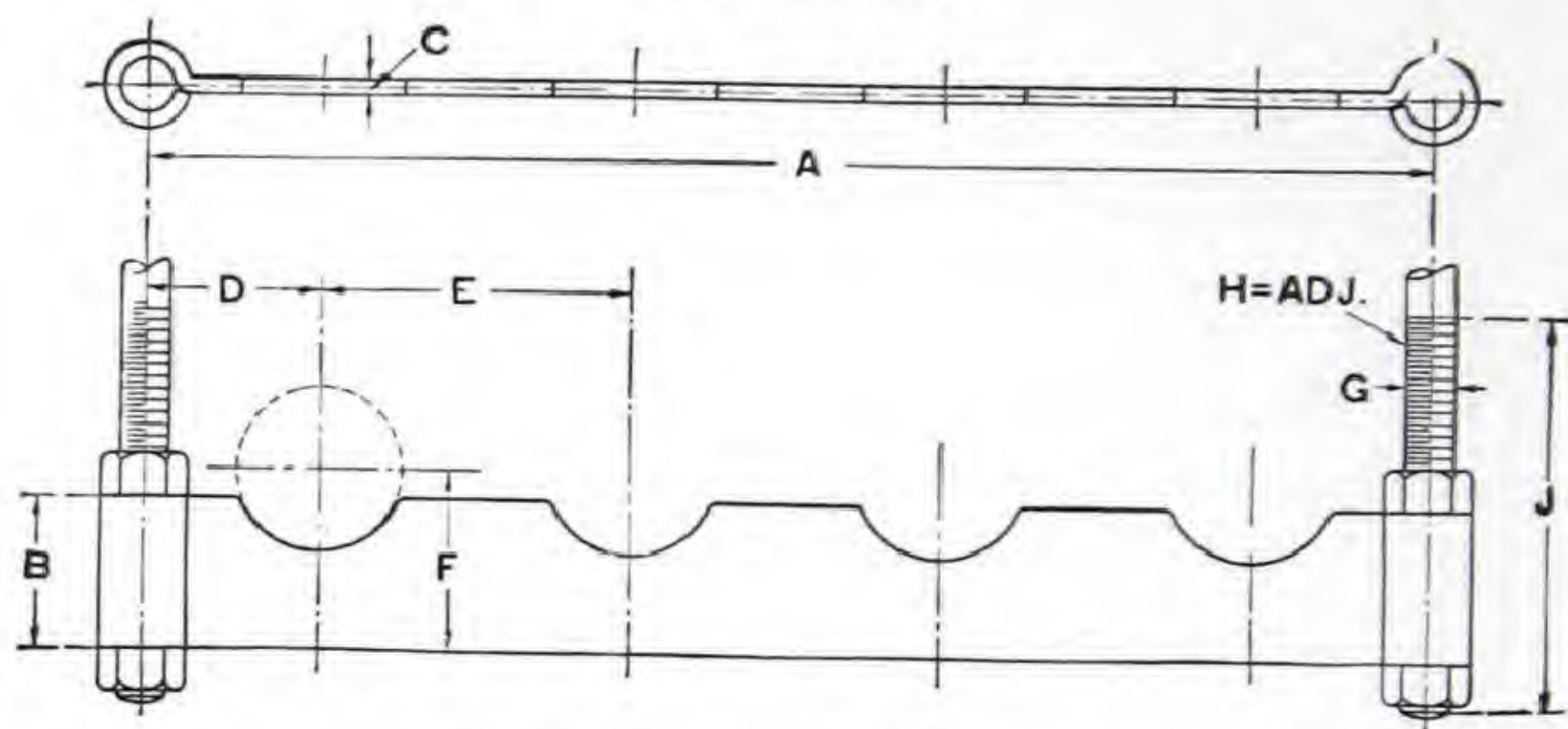
Expansion Type—Fig. No. 170

LIST PRICES AND DIMENSIONS

Pipe Size	Number of Branches	Price Each	A	B	C	D	E	F	G
1	2	\$0.15	7 1/2	1 1/4	3/16	1 7/8	1/2	2 3/4	5
	3	.20	10	"	"	"	"	"	"
	4	.25	12 1/2	"	"	"	"	"	"
	5	.30	15	"	"	"	"	"	"
	6	.35	17 1/2	"	"	"	"	"	"
	7	.40	20	1 1/2	1/4	2 1/8	"	2 1/2	"
	8	.50	22 1/2	"	"	"	"	"	"
	9	.55	25	"	"	"	5/8	3	5 3/4
	10	.60	27 1/2	"	"	"	"	"	"
	12	.75	32 1/2	"	"	"	"	"	"
1 1/4	2	.20	8 1/4	1 1/2	3/16	2 5/16	1/2	2 1/2	5
	3	.25	11 1/4	"	"	"	"	"	"
	4	.30	14 1/4	"	"	"	"	"	"
	5	.35	17 1/4	"	"	"	"	"	"
	6	.40	20 1/4	"	"	"	"	"	"
	7	.45	23 1/4	1 3/4	1/4	2 9/16	"	2 1/4	"
	8	.55	26 1/4	"	"	"	"	"	"
	9	.70	29 1/4	"	"	"	5/8	2 3/4	5 3/4
	10	.85	32 1/4	"	"	"	"	"	"
	12	1.10	38 1/4	"	"	"	"	"	"

List Prices do not include hanger rods and nuts.
Order by Figure Number.

HANGERS

Grinnell Saddle Hangers
(Continued)

Standard Type—Fig. No. 169

LIST PRICES AND DIMENSIONS

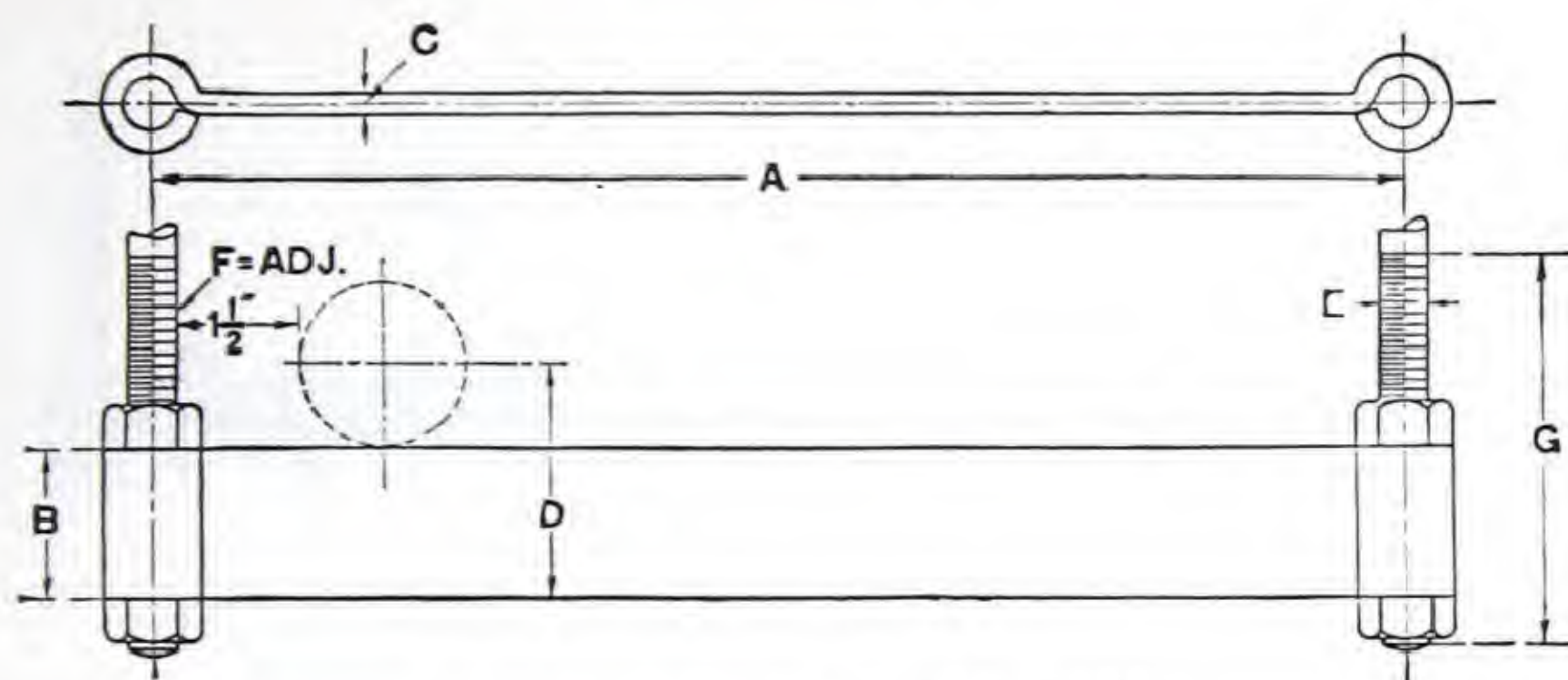
Pipe Size	Number of Branches	Price Each	A	B	C	D	E	F	G	H	J
1½	2	\$0.35	7½	1¾	3/16	2	3½	2 1/16	1/2	2 1/4	5
	3	.40	11	"	"	"	"	"	"	"	"
	4	.45	14½	"	"	"	"	"	"	"	"
	5	.50	18	"	"	"	"	"	"	"	"
	6	.55	21½	"	"	"	"	"	"	"	"
	7	.60	25	2	1/4	"	"	2 5/16	"	2	"
	8	.70	28½	"	"	"	"	"	"	"	"
	9	.85	32	"	"	"	"	"	5/8	2 1/2	5 3/4
	10	1.05	35½	2 1/2	"	"	"	2 13/16	"	2	"
	12	1.40	42½	"	"	"	"	"	"	"	"
2	2	.40	9	2	1/4	2 1/4	4 1/2	2 1/2	1/2	2	5
	3	.45	13½	"	"	"	"	"	"	"	"
	4	.50	18	"	"	"	"	"	"	"	"
	5	.55	22½	"	"	"	"	"	"	"	"
	6	.60	27	"	"	"	"	"	"	"	"
	7	.75	31½	2 1/2	"	"	"	3	"	1 1/2	"
	8	.85	36	"	"	"	"	"	"	"	"
	9	1.00	40½	"	"	"	"	"	5/8	2	5 3/4
	10	1.20	45	3	"	"	"	3 1/2	"	1 1/2	"
	12	1.50	54	"	"	"	"	"	"	"	"

List Prices do not include hanger rods and nuts.
Order by Figure Number.

HANGERS

Grinnell Saddle Hangers

(Continued)



Expansion Type—Fig. No. 170

LIST PRICES AND DIMENSIONS

Pipe Size	Number of Branches	Price Each	A	B	C	D	E	F	G
1 1/2	2	\$0.30	9	1 1/2	3/16	2 7/16	1/2	2 1/2	5
	3	.35	12 1/2	"	"	"	"	"	"
	4	.40	16	"	"	"	"	"	"
	5	.45	19 1/2	"	"	"	"	"	"
	6	.50	23	"	"	"	"	"	"
	7	.55	26 1/2	1 3/4	1/4	2 11/16	"	2 1/4	"
	8	.65	30	"	"	"	"	"	"
	9	.75	33 1/2	"	"	"	5/8	2 3/4	5 3/4
	10	.90	37	"	"	"	"	"	"
	12	1.20	44	"	"	"	"	"	"
2	2	.35	10 1/2	1 3/4	1/4	2 15/16	1/2	2 1/4	5
	3	.40	15	"	"	"	"	"	"
	4	.45	19 1/2	"	"	"	"	"	"
	5	.50	24	"	"	"	"	"	"
	6	.55	28 1/2	"	"	"	"	"	"
	7	.65	33	2 1/2	"	3 11/16	"	1 1/2	"
	8	.75	37 1/2	"	"	"	"	"	"
	9	.90	42	"	"	"	5/8	2	5 3/4
	10	1.10	46 1/2	"	"	"	"	"	"
	12	1.40	55 1/2	"	"	"	"	"	"

List Prices do not include hanger rods and nuts.
Order by Figure Number.

HANGERS

Grinnell Single Pipe Rolls—Branch Pipe Rolls

Branch Pipe Rolls—Fig. No. 172

Expansion Branch Pipe Rolls—Fig. No. 172-E

Single Pipe Rolls
Fig. No. 171

Grinnell Single and Branch Pipe Rolls are especially designed to take care of expansion and contraction. Rolls are made hollow which means small surface in contact with rod. See Line Sketch on opposite page.

The Adjustable Sockets permit vertical adjustment at the roll. The nut at the bottom of the hanger rod fits into a recess in the socket thus preventing loosening or turning from vibration.

On Branch Pipe Rolls for seven to twelve branches inclusive, an adjustable hook is provided for a third or center hanger rod. See dimension drawing.

Notes:—For List Prices and Dimensions of 1", 1¼" and 1½" Branch Rolls,—see following pages.

For 2" overhead coils use Saddle Hangers. See preceding pages.

INSTRUCTIONS FOR ORDERING—SINGLE PIPE ROLLS

To order Single Pipe Rolls with Roll Rods and Adjustable Sockets, specify:

.....(Quantity).....(Size) Pipe Rolls, Rods and Adjustable Sockets, Fig. No. 171.

To order Single Pipe Rolls without Roll Rods or Adjustable Sockets, specify:

.....(Quantity).....(Size) Pipe Rolls, Fig. No. 173.

To order Adjustable Sockets only, specify:

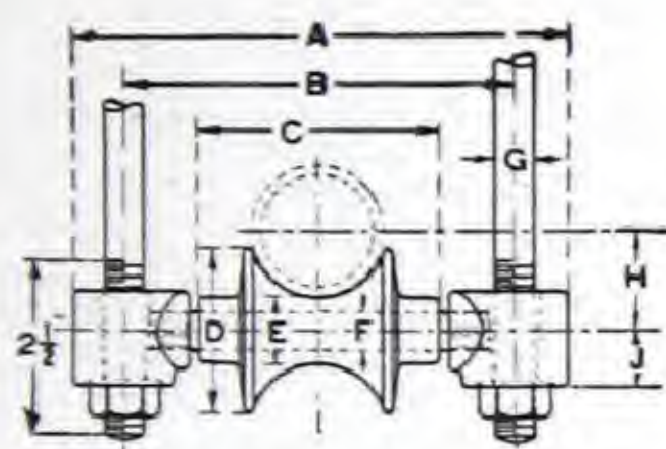
.....(Quantity).....No. () Adjustable Sockets, Fig. No. 171-A.

Note: Hanger Rods and nuts are to be ordered separately.

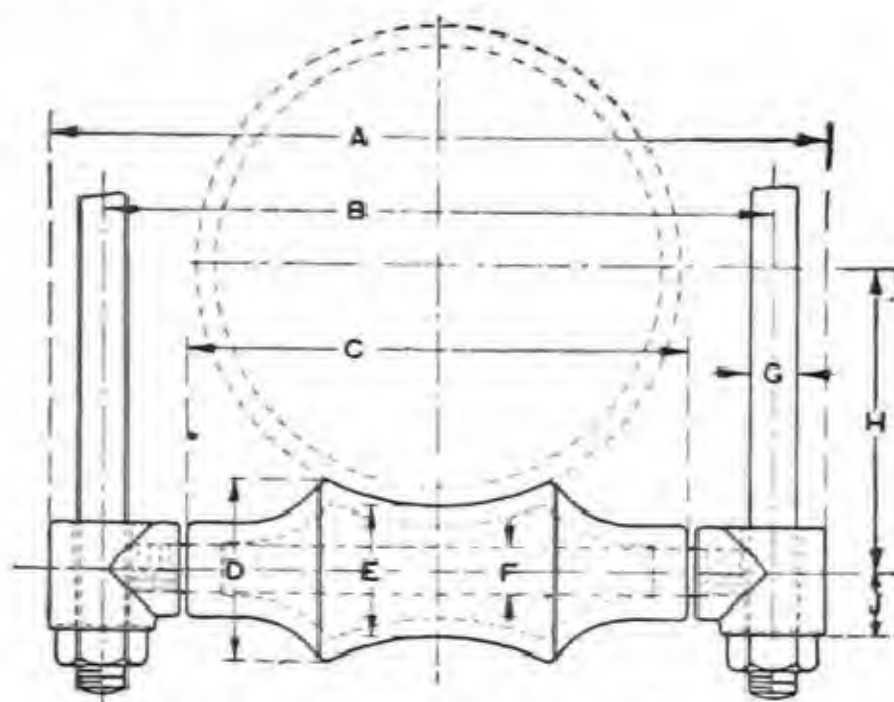
HANGERS

Grinnell Single Pipe Rolls

Fig. No. 171



For Pipe 1" to 1 1/2"



For Pipe 2" to 18"

LIST PRICES AND DIMENSIONS

Pipe Size	PRICE EACH			No. of Adj. Socket	DIMENSIONS								
	Pipe Rolls with Roll Rods and Adj. Sock.	Pipe Rolls only Fig. No. 173	Adj. Sockets only, Each-Fig. No. 171-A		A	B	C	D	E	F	G	H	J
1	\$0.35	\$0.08	\$.18	1	5 5/8	4 1/2	2 7/16	1 15/16	1			1 3/16	
1 1/4	.35	.09	.18		6 1/8	5	2 15/16	2 1/8	1	5/8	3/8	1 5/16	13/16
1 1/2	.35	.10	.18		6 5/8	5 1/2	3 7/16	2 3/8	1			1 7/16	
2	.40	.13	.18		6	4 7/8	2 7/8	1 3/8	1 3/16			1 3/4	
2 1/2	.40	.15	.20	2	7 1/2	6 1/8	4	1 9/16	1 5/16			2 1/16	
3	.45	.18	.20		7 1/2	6 1/8	4	1 5/8	1 5/16	5/8	1/2	2 3/8	7/8
3 1/2	.45	.21	.20		7 7/8	6 1/2	4 1/4	1 7/8	1 1/2			2 3/4	
4	.45	.21	.20	3	8 3/4	7 1/8	4 3/4	1 15/16	1 1/2			3	
4 1/2	.55	.24	.20		9 1/4	7 5/8	5 1/4	2 1/8	1 5/8	5/8	5/8	3 5/16	7/8
5	.65	.24	.20		9 13/16	8 3/16	5 13/16	2 5/16	1 3/4			3 5/8	
6	.75	.27	.22	4	11 5/8	9 3/4	6 7/8	2 9/16	1 7/8	3/4	3/4	4 1/4	1
7	.85	.36	.22		12 5/8	10 3/4	7 7/8	2 7/8	2 1/8			4 7/8	
8	1.25	.60	.25	5	14 1/4	12 1/8	8 7/8	3 3/8	2 7/16			5 1/2	
9	1.80	1.00	.25		15 1/4	13 1/8	9 7/8	3 3/4	2 11/16	7/8	7/8	6 1/8	1 1/8
10	2.20	1.40	.25		16 3/8	14 1/4	11	4 1/8	3			6 7/8	
12	3.50	2.00	.25		18 3/8	16 1/4	13	4 5/8	3 1/4			8	
14	4.00	2.75	.40	6	20 1/4	17 7/8	14 1/4	4 7/8	3 3/8			8 11/16	
15	5.00	3.50	.40		21 1/4	18 7/8	15 1/4	5	3 3/8	1	1	9 3/16	1 1/4
16	6.00	4.50	.40		22 1/4	19 7/8	16 1/4	5 3/8	3 5/8			9 13/16	
18	8.00	6.00	.60	7	24 7/8	22 1/4	18 1/4	5 11/16	3 3/4	1 1/8	1 1/8	10 7/8	1 3/8

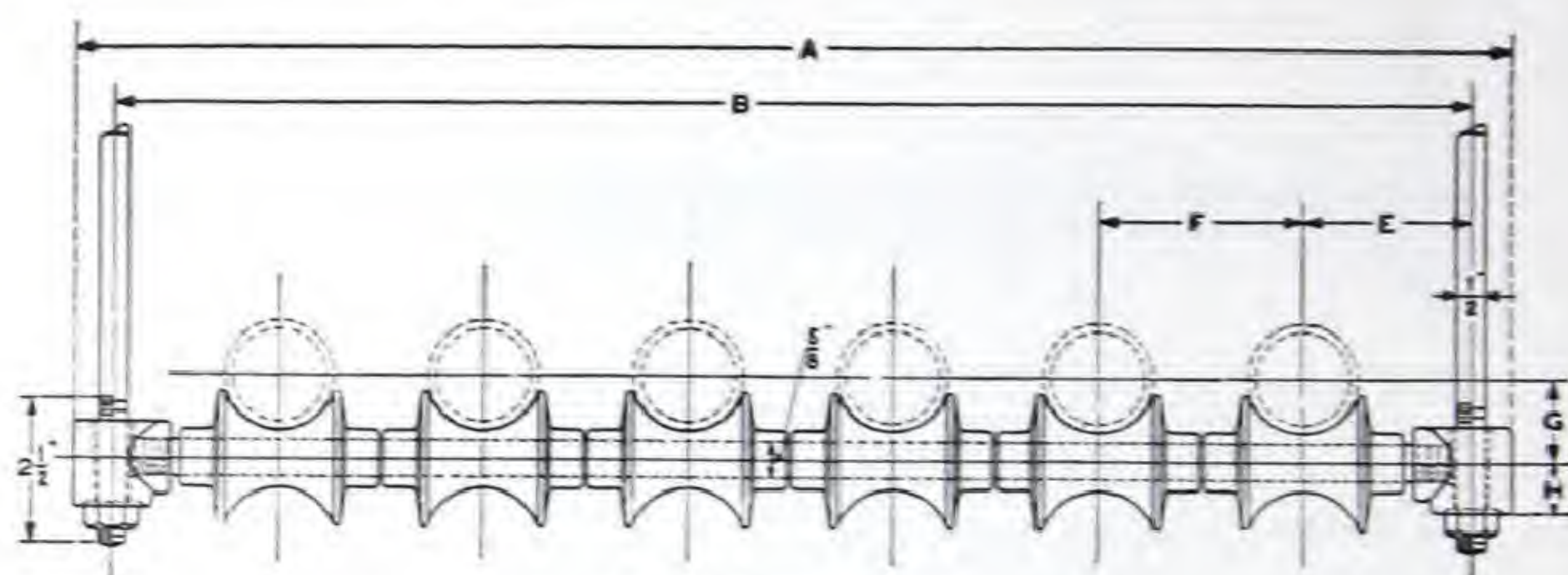
Order by Figure Number.

HANGERS

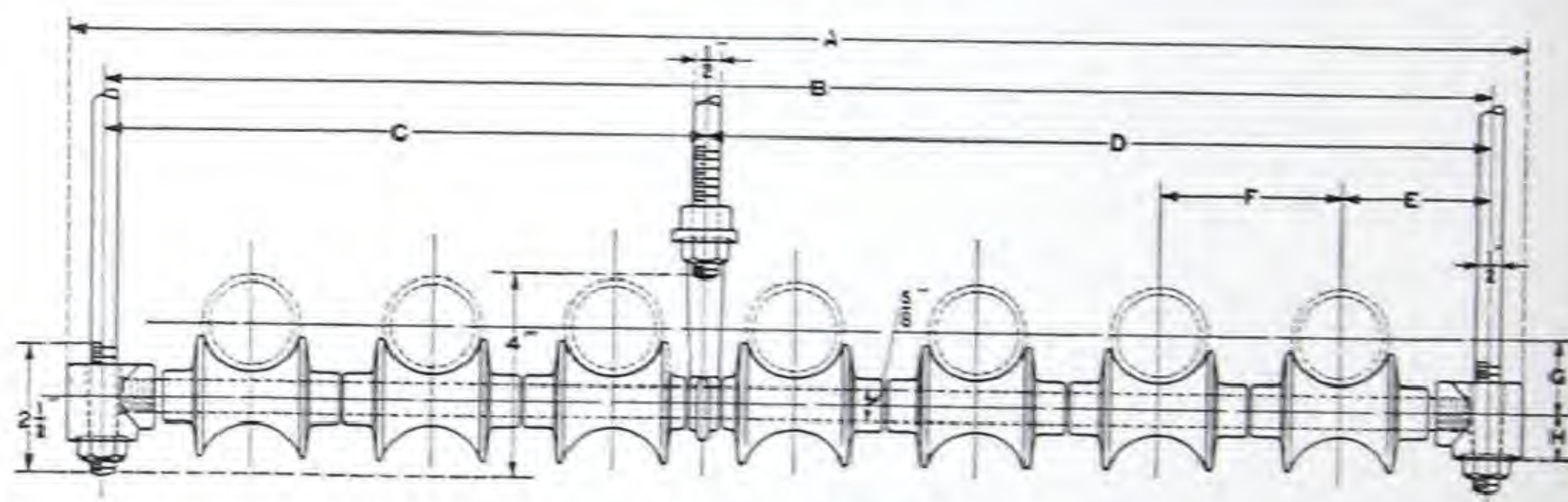
Grinnell Branch Pipe Rolls

Standard, Fig. No. 172

Expansion, (Not Illustrated) Fig. No. 172-E



2 to 6 Branch Rolls



7 to 12 Branch Rolls showing Adjustable Hook for Center Hanger Rod

INSTRUCTIONS FOR ORDERING

To order Branch Pipe Rolls with Roll Rods and Adjustable Sockets, specify:

.....(Quantity).....(Size).....(No.) branch Pipe Rolls, Rods and Adjustable Sockets, Fig. No. 172.

To order Expansion Branch Pipe Rolls with Roll Rods and Adjustable Sockets, specify:

.....(Quantity).....(Size).....(No.) branch Expansion Pipe Rolls, Rods and Adjustable Sockets, Fig. No. 172-E.

To order Adjustable Sockets only, specify:

.....(Quantity).....No. 2 Adjustable Sockets, Fig. No. 171-A.

To order Adjustable Hooks only, specify:

.....(Quantity).....Adjustable Hooks, Fig. No. 172-A.

Note: Hanger Rods and nuts are to be ordered separately.

HANGERS

Grinnell Branch Pipe Rolls

Standard, Fig. No. 172—Expansion, Fig. No. 172-E

LIST PRICES AND DIMENSIONS

Pipe Size	Number of Branches	PRICE EACH			No. of Adj. Socket	DIMENSIONS							
		Fig. Nos. 172—172-E	Adj. Socket F. No. 171-A	Adj. Hook F. No. 172-A		A	B	C	D	E	F	G	H
1-Inch	2	\$.55	\$.20	..	2	8 ⁵ / ₈	7 ¹ / ₄	..	..	2 ³ / ₈	2 ¹ / ₂	1 ¹ / ₈	7 ⁷ / ₈
	3	.75	.20	..	2	11 ¹ / ₈	9 ³ / ₄	..	..	"	"	"	"
	4	.85	.20	..	2	13 ⁵ / ₈	12 ¹ / ₄	..	..	"	"	"	"
	5	.95	.20	..	2	16 ¹ / ₈	14 ³ / ₄	..	..	"	"	"	"
	6	1.05	.20	..	2	18 ⁵ / ₈	17 ¹ / ₄	..	..	"	"	"	"
	7	1.30	.20	\$.15	2	21 ¹ / ₈	19 ³ / ₄	8 ⁵ / ₈	11 ¹ / ₈	"	"	"	"
	8	1.45	.20	.15	2	23 ⁵ / ₈	22 ¹ / ₄	11 ¹ / ₈	11 ¹ / ₈	"	"	"	"
	9	1.50	.20	.15	2	26 ¹ / ₈	24 ³ / ₄	11 ¹ / ₈	13 ⁵ / ₈	"	"	"	"
	10	1.60	.20	.15	2	28 ⁵ / ₈	27 ¹ / ₄	13 ⁵ / ₈	13 ⁵ / ₈	"	"	"	"
	11	1.70	.20	.15	2	31 ¹ / ₈	29 ³ / ₄	13 ⁵ / ₈	16 ¹ / ₈	"	"	"	"
	12	1.80	.20	.15	2	33 ⁵ / ₈	32 ¹ / ₄	16 ¹ / ₈	16 ¹ / ₈	"	"	"	"
1 1/4-Inch	2	.60	.20	..	2	9 ⁵ / ₈	8 ¹ / ₄	..	..	2 ⁵ / ₈	3	1 ⁵ / ₁₆	7 ⁷ / ₈
	3	.80	.20	..	2	12 ⁵ / ₈	11 ¹ / ₄	..	..	"	"	"	"
	4	.90	.20	..	2	15 ⁵ / ₈	14 ¹ / ₄	..	..	"	"	"	"
	5	1.00	.20	..	2	18 ⁵ / ₈	17 ¹ / ₄	..	..	"	"	"	"
	6	1.10	.20	..	2	21 ⁵ / ₈	20 ¹ / ₄	..	..	"	"	"	"
	7	1.35	.20	.15	2	24 ⁵ / ₈	23 ¹ / ₄	10 ¹ / ₈	13 ¹ / ₈	"	"	"	"
	8	1.60	.20	.15	2	27 ⁵ / ₈	26 ¹ / ₄	13 ¹ / ₈	13 ¹ / ₈	"	"	"	"
	9	1.70	.20	.15	2	30 ⁵ / ₈	29 ¹ / ₄	13 ¹ / ₈	16 ¹ / ₈	"	"	"	"
	10	1.80	.20	.15	2	33 ⁵ / ₈	32 ¹ / ₄	16 ¹ / ₈	16 ¹ / ₈	"	"	"	"
	11	1.90	.20	.15	2	36 ⁵ / ₈	35 ¹ / ₄	16 ¹ / ₈	19 ¹ / ₈	"	"	"	"
	12	2.00	.20	.15	2	39 ⁵ / ₈	38 ¹ / ₄	19 ¹ / ₈	19 ¹ / ₈	"	"	"	"
1 1/2-Inch	2	.65	.20	..	2	10 ⁵ / ₈	9 ¹ / ₄	..	..	2 ⁷ / ₈	3 ¹ / ₂	1 ⁷ / ₁₆	7 ⁷ / ₈
	3	.85	.20	..	2	14 ¹ / ₈	12 ³ / ₄	..	..	"	"	"	"
	4	1.00	.20	..	2	17 ⁵ / ₈	16 ¹ / ₄	..	..	"	"	"	"
	5	1.10	.20	..	2	21 ¹ / ₈	19 ³ / ₄	..	..	"	"	"	"
	6	1.25	.20	..	2	24 ⁵ / ₈	23 ¹ / ₄	..	..	"	"	"	"
	7	1.50	.20	.15	2	28 ¹ / ₈	26 ³ / ₄	11 ⁵ / ₈	15 ¹ / ₈	"	"	"	"
	8	1.75	.20	.15	2	31 ⁵ / ₈	30 ¹ / ₄	15 ¹ / ₈	15 ¹ / ₈	"	"	"	"
	9	1.85	.20	.15	2	35 ¹ / ₈	33 ³ / ₄	15 ¹ / ₈	18 ⁵ / ₈	"	"	"	"
	10	2.00	.20	.15	2	38 ⁵ / ₈	37 ¹ / ₄	18 ⁵ / ₈	18 ⁵ / ₈	"	"	"	"
	11	2.10	.20	.15	2	42 ¹ / ₈	40 ³ / ₄	18 ⁵ / ₈	22 ¹ / ₈	"	"	"	"
	12	2.25	.20	.15	2	45 ⁵ / ₈	44 ¹ / ₄	22 ¹ / ₈	22 ¹ / ₈	"	"	"	"

Notes:—For Expansion Branch Rolls, add 1 1/2 inches to Dimensions and B.

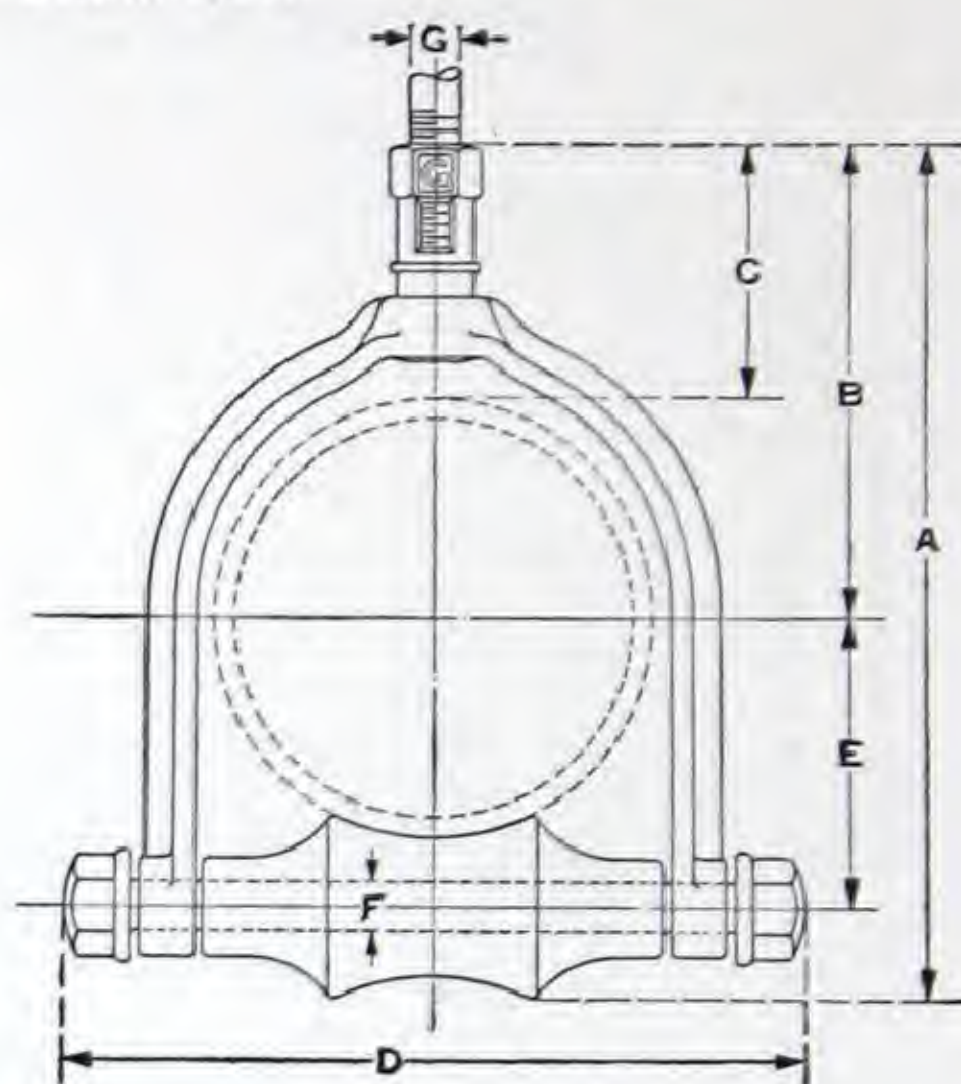
For 2" overhead coils, use Saddle Hangers—See pages 433 to 437.

Order by Figure Number.

HANGERS

Grinnell Adjustable Swivel Pipe Rolls

(Patented Oct. 4, 1921)

Adjustable Swivel Pipe Roll
Fig. No. 174

LIST PRICES AND DIMENSIONS

PIPE SIZE	PRICE EACH	DIMENSIONS						
		A	B	C	D	E	F	G
2½	\$1.00	7 ⁷ / ₁₆	4 ⁹ / ₁₆	3 ¹ / ₈	7 ¹ / ₈	2 ¹ / ₁₆	5/8	1/2
3	1.25	7 ⁷ / ₁₆	4 ¹ / ₄	2 ¹ / ₂	7 ¹ / ₈	2 ³ / ₈	5/8	1/2
3½	1.50	8 ¹ / ₈	4 ⁷ / ₁₆	2 ⁷ / ₁₆	7 ⁵ / ₈	2 ³ / ₄	5/8	1/2
4	1.75	9 ³ / ₈	5 ³ / ₈	3 ¹ / ₈	8 ³ / ₁₆	3	5/8	5/8
4½	2.00	9 ¹⁵ / ₁₆	5 ⁹ / ₁₆	3 ¹ / ₁₆	8 ¹¹ / ₁₆	3 ⁵ / ₁₆	5/8	5/8
5	2.50	10 ⁵ / ₈	5 ¹³ / ₁₆	3	9 ¹ / ₄	3 ⁵ / ₈	5/8	5/8
6	2.75	12 ⁵ / ₈	7 ¹ / ₁₆	3 ³ / ₄	11 ¹ / ₄	4 ¹ / ₄	3/4	3/4
7	3.50	13 ⁷ / ₈	7 ⁹ / ₁₆	3 ³ / ₄	12 ¹ / ₄	4 ⁷ / ₈	3/4	3/4
8	4.25	16	8 ³ / ₄	4 ⁷ / ₁₆	13 ³ / ₄	5 ⁹ / ₁₆	7/8	7/8

The Adjustable Swivel Pipe Roll supplies the need for an adjustable type of pipe roll hanger with single hanger rod. It is unique inasmuch as vertical adjustment can be made by use of the Swivel Shank at the top of the hanger.

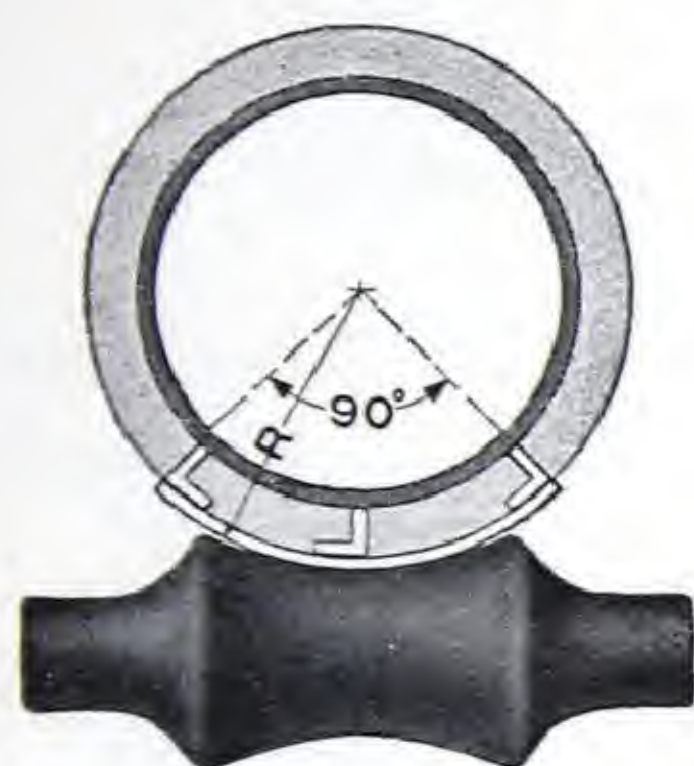
As in the Swivel Pipe Ring, Fig. No. 101 shown on page 391, the Swivel Shank automatically locks, preventing loosening due to vibration in the pipe line.

When Fig. No. 174 Adjustable Swivel Pipe Rolls are to be used on line on which pipe covering is to be installed, order hangers two full sizes larger than pipe. This allows for the installation of 1-inch standard thick covering. When Pipe Covering Protection Saddles are to be used, order Pipe Rolls in accordance with sizes indicated in tables on page 442-A.

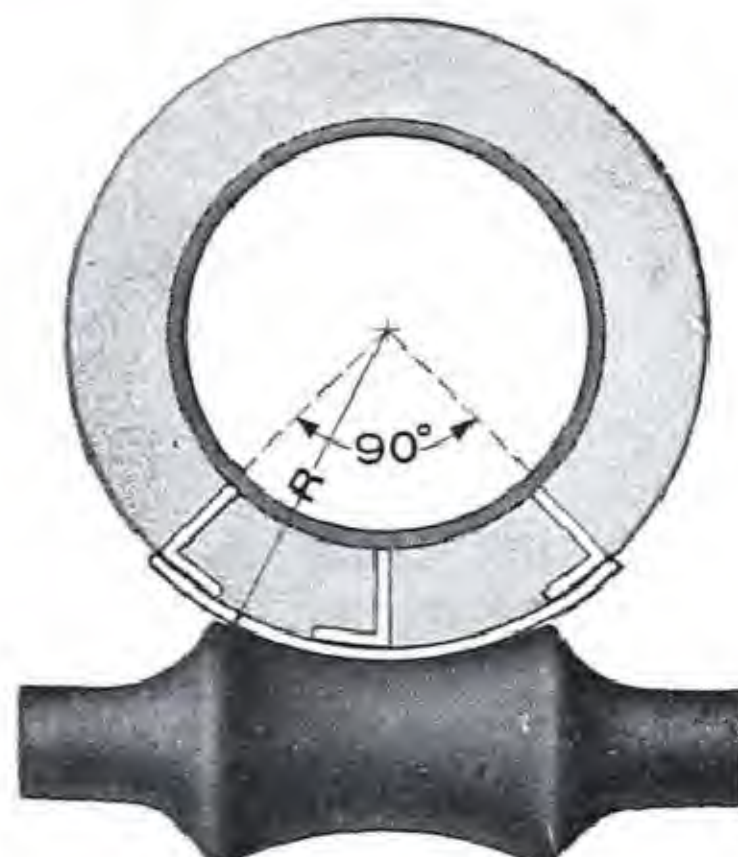
Order by Figure Number.

HANGERS

Pipe Covering Protection Saddles
Steel



For 1-Inch Covering
Fig. No. 186



For 2-Inch Covering
Fig. No. 187

LIST PRICES AND DIMENSIONS

Fig. No. 186				Fig. No. 187			
Pipe Size	Price Each	R Inches	Pipe Roll Size	Pipe Size	Price Each	R Inches	Pipe Roll Size
3	\$2.35	3	6	3	\$3.35	4	8
3½	2.50	3¼	6	3½	3.35	4¼	8
4	2.50	3½	8	4	3.35	4½	10
4½	2.50	3¾	8	4½	3.50	4¾	10
5	2.75	4	8	5	3.50	5	10
6	2.75	4⅞	10	6	3.50	5⅞	12
7	2.75	5⅛	10	7	3.75	6⅛	12
8	3.00	5⅞	12	8	3.75	6⅞	14
9	3.00	6⅛	12	9	3.85	7⅛	15
10	3.00	6⅝	14	10	3.85	7⅝	16
12	3.35	7⅝	16	12	4.25	8⅝	18
14	3.35	8¼	18	14	4.25	9¼	20
15	3.35	8¾	18	15	4.25	9¾	20
16	3.50	9¼	20	....	....	...	....

All Saddles are 12-inches long.

Pipe Covering Protection Saddles are made for use on steam pipes insulated with pipe covering either 1-inch or 2-inches thick.

Saddles are furnished unfilled and should be filled before being put in place either with plastic cement or with sectional covering cut to suit.

Order by Figure Number.

HANGERS

Pipe Covering Protection Saddles

The Grinnell Pipe Covering Protection Saddles illustrated on the preceding page are the latest addition to the general line of Grinnell Pipe Hangers and Supports.

These Saddles were designed to permit the complete insulation of steam pipes and at the same time allow the use of pipe rolls to take care of expansion and contraction in the pipe line.

As the illustrations indicate, the Saddles are composed of curved steel plates twelve inches long with side edges turned up and a center plate welded in. The three upper edges of the Saddles will bear on the pipe while the space between the center plate and the sides should be filled before being put in place either with plastic cement or with sectional covering cut to suit. When the pipe line is covered at completion of the piping installation, the sectional covering can readily be cut to fit tight against sides and ends of Saddles.

HANGERS

*Grinnell Two-Pipe Adjustable Brackets**Cast Iron*

Small Pipe at Top
Fig. No. 175



Large Pipe at Top
Fig. No. 176

This hanger is a combination of two standard pipe rolls and a bracket. It is designed principally for supporting pipe mains in tunnels or against walls, where for convenience or economy it is necessary to carry one pipe directly over the other. Designed to support pipe up to 6-inch. The economy of this Two-Pipe Adjustable Hanger lies in allowing the installation of one bracket to take care of two lines. Also this hanger, by means of the pipe roll, will take care of any amount of expansion without buckling or throwing pipe out of alignment.

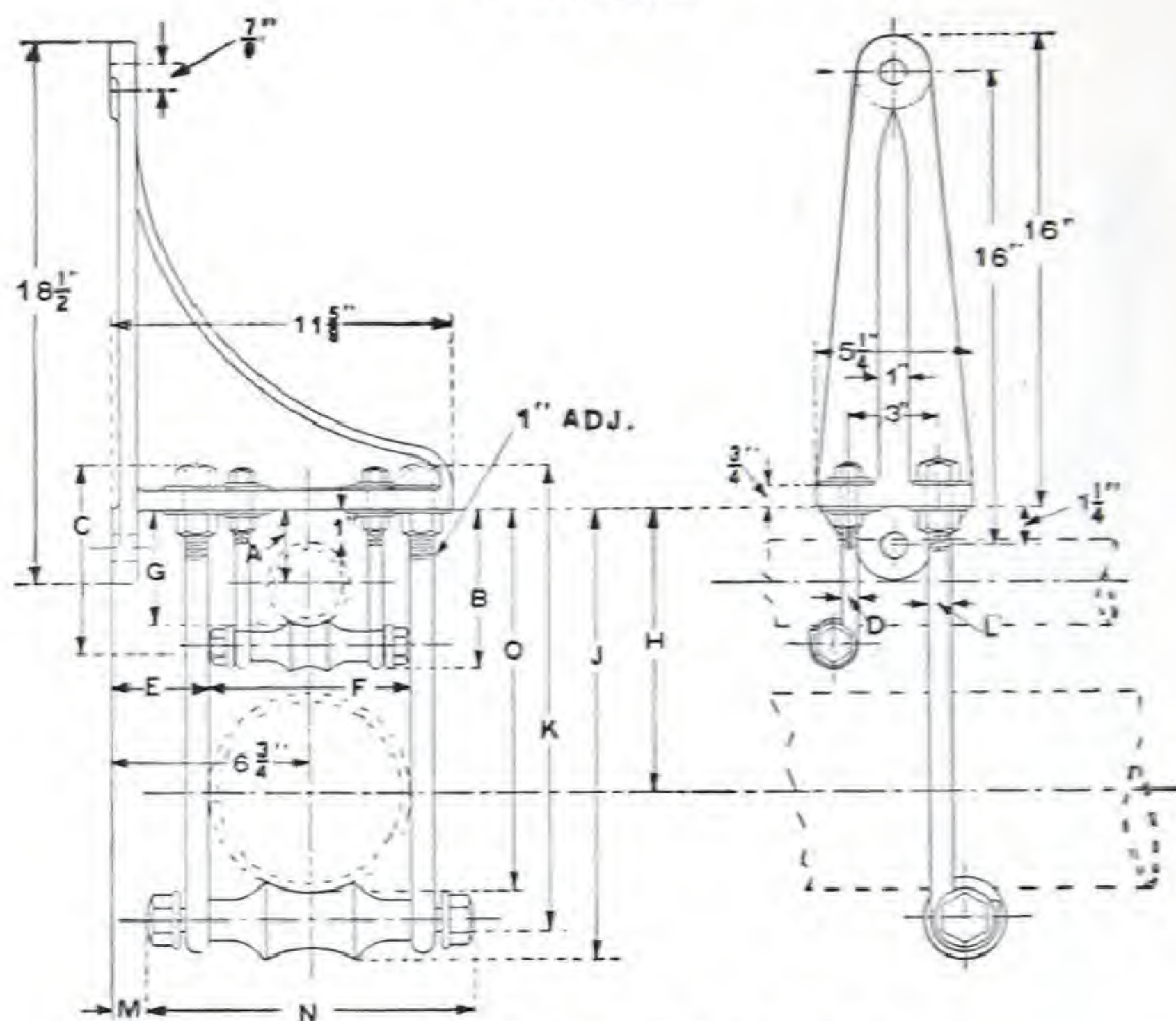
Note that bracket is constructed so that small pipe can be installed at top and large pipe below or vice versa. This is accomplished by slots in the bracket.

The Adjustable Two-Pipe Hanger like most Grinnell hangers is adjustable, easily installed, compact in construction and economical to use because of its double service.

When ordering always give size of top and bottom pipe.

Order by Figure Number.

HANGERS

Grinnell Two-Pipe Adjustable Brackets
Cast Iron

Small Pipe on Top—Fig. No. 175

Note:—Dimensions C and K are minimum lengths for hanger rods. List Prices include machine threaded Hook Rods in lengths C and K. For list prices on Hook Rods of additional lengths, see page 478.

LIST PRICES AND DIMENSIONS—Fig. No. 175

Top Pipe Size	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	3	3	3
Bottom Pipe Size	2 1/2	3	3 1/2	4	4 1/2	5	6	3	3 1/2	4
Price, Ea.	\$5.75	5.75	5.75	6.00	6.00	6.00	6.50	6.00	6.00	6.00
A	2 7/16	2 7/16	2 7/16	2 7/16	2 7/16	2 7/16	2 7/16	2 3/4	2 3/4	2 3/4
B	5 5/16	5 5/16	5 5/16	5 5/16	5 5/16	5 5/16	5 5/16	6	6	6
C	6 1/4	6 1/4	6 1/4	6 1/4	6 1/4	6 1/4	6 1/4	6 3/4	6 3/4	6 3/4
D	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2
E	3 1/8	3 1/8	3 1/8	3 1/8	3 1/8	3 1/8	3 1/8	3 1/8	3 1/8	3 1/8
F	7 1/4	7 1/4	7 1/4	7 1/4	7 1/4	7 1/4	7 1/4	7 1/4	7 1/4	7 1/4
G	3 7/8	3 7/8	3 7/8	3 7/8	3 7/8	3 7/8	3 7/8	4 1/2	4 1/2	4 1/2
H	7 5/8	7 5/8	8 3/16	8 7/16	8 11/16	8 15/16	9 1/2	8 9/16	8 13/16	9 1/8
J	10 1/2	11 5/16	11 7/8	12 7/16	13 1/16	13 13/16	15 1/16	11 13/16	12 1/2	13 1/8
K	11 3/8	12	12 3/4	13 1/4	13 3/4	14 1/2	15 1/2	12 3/4	13 1/4	13 3/4
L	1 1/2	1 1/2	1 1/2	5/8	5/8	5/8	3/4	1 1/2	1 1/2	5/8
M	3 1/8	3 1/8	3	2 9/16	2 5/16	2	1 1/4	3 1/8	3	2 9/16
N	7 1/4	7 1/4	7 1/2	8 3/8	8 7/8	9 7/16	11	7 1/4	7 1/2	8 3/8
O	9 1/8	9 11/16	10 5/16	10 11/16	11 3/16	11 3/4	12 13/16	10 5/16	10 13/16	11 5/16

Order by Figure Number.

HANGERS

Grinnell Two-Pipe Adjustable Brackets

Cast Iron

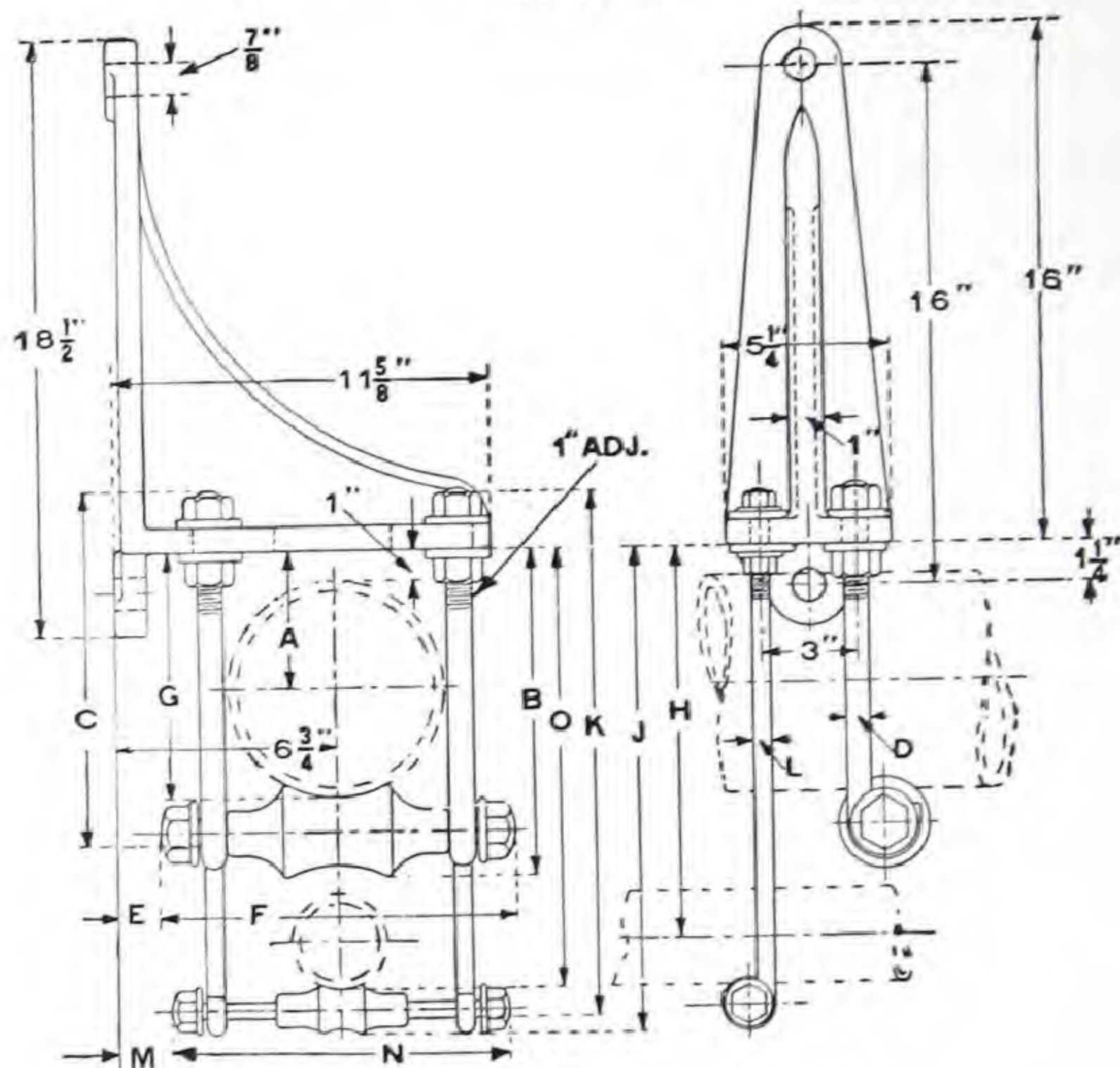
SMALL PIPE ON TOP—Fig. No. 175—(Continued)

Top Pipe Size	3	3	3	3½	3½	3½	3½	3½	4
Bottom Pipe Size	4½	5	6	3½	4	4½	5	6	4
Price Ea.	\$6.00	6.00	6.50	5.75	6.00	6.00	6.00	6.00	6.50
A	2¾	2¾	2¾	3	3	3	3	3	3½
B	6	6	6	6½	6½	6½	6½	6½	7¼
C	6¾	6¾	6¾	7½	7½	7½	7½	7½	8½
D	1½	1½	1½	1½	1½	1½	1½	1½	2½
E	3½	3½	3½	3	3	3	3	3	2½
F	7¼	7¼	7¼	7½	7½	7½	7½	7½	8½
G	4½	4½	4½	5	5	5	5	5	5½
H	9½	9½	10½	9½	9¾	10	10½	10½	10½
J	13½	14½	15½	13½	13¾	14¾	15½	16¾	14½
K	14¾	15	16¼	13¾	14½	15	15¾	16¾	15
L	5½	5½	¾	1½	5½	5½	5½	¾	5½
M	2½	2	1¼	3	2½	2½	2	1¼	2½
N	8¾	9½	11	7½	8¾	8¾	9½	11	8¾
O	11½	12¾	13½	11½	12	12½	13½	14½	12½

Top Pipe Size	4	4	4	4½	4½	4½	5	5	6
Bottom Pipe Size	4½	5	6	4½	5	6	5	6	6
Price Ea.	\$6.50	6.50	6.50	6.50	6.50	6.50	6.50	6.50	7.00
A	3½	3½	3½	3½	3½	3½	3¾	3¾	4½
B	7¼	7¼	7¼	7¾	7¾	7¾	8½	8½	9¾
C	8½	8½	8½	8¾	8¾	8¾	9½	9½	10½
D	5½	5½	5½	5½	5½	5½	5½	5½	¾
E	2½	2½	2½	2½	2½	2½	2	2	1¼
F	8¾	8¾	8¾	8¾	8¾	8¾	9½	9½	11
G	5½	5½	5½	6	6	6	6½	6½	7½
H	10½	10¾	11½	11½	11¾	11½	12½	12½	13½
J	14¾	15½	16¾	15½	16¼	17½	16½	18½	19¾
K	15¾	16¼	17½	16¼	17	18½	17½	18¾	20
L	5½	5½	¾	5½	5½	¾	5½	¾	¾
M	2½	2	1¼	2½	2	1¼	2	1¼	1¼
N	8¾	9½	11	8¾	9½	11	9½	11	11
O	13	13½	14½	13½	14½	15½	14½	15½	17½

Order by Figure Number.

HANGERS

Grinnell Two-Pipe Adjustable Brackets
Cast Iron

Large Pipe on Top—Fig. No. 176

Note:—Dimensions C and K are minimum lengths for hanger rods. List Prices include machine threaded Hook Rods in lengths C and K. For list prices on Hook Rods of additional lengths, see page 478.

LIST PRICES AND DIMENSIONS—Fig. No. 176

Top Pipe Size	2 1/2	3	3	3 1/2	3 1/2	3 1/2	4	4	4	4
Bottom Pipe Size	2 1/2	2 1/2	3	2 1/2	3	3 1/2	2 1/2	3	3 1/2	4
Price, Ea.	\$5.75	5.75	5.75	5.75	5.75	5.75	5.75	6.00	6.00	6.50
A	2 7/16	2 3/4	2 3/4	3	3	3	3 1/4	3 1/4	3 1/4	3 1/4
B	5 5/16	6	6	6 11/16	6 11/16	6 11/16	7 1/4	7 1/4	7 1/4	7 1/4
C	6 1/4	6 3/4	6 3/4	7 1/2	7 1/2	7 1/2	8 1/8	8 1/8	8 1/8	8 1/8
D	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	5/8	5/8	5/8	5/8
E	3 1/8	3 1/8	3 1/8	3	3	3	2 9/16	2 9/16	2 9/16	2 9/16
F	7 1/4	7 1/4	7 1/4	7 1/2	7 1/2	7 1/2	8 3/8	8 3/8	8 3/8	8 3/8
G	3 7/8	4 1/2	4 1/2	5	5	5	5 1/2	5 1/2	5 1/2	5 1/2
H	7 5/8	8 1/4	8 9/16	8 15/16	9 1/4	9 1/2	9 7/16	9 3/4	10	10 1/4
J	10 1/2	11 1/8	11 13/16	11 13/16	12 7/16	13 3/16	12 5/16	13	13 11/16	14 1/4
K	11 3/8	12	12 3/4	12 3/4	13 1/4	13 7/8	13 1/4	13 7/8	14 3/8	15
L	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	5/8
M	3 1/8	3 1/8	3 1/8	3	3	3	2 3/4	2 5/8	2 9/16	2 9/16
N	7 1/4	7 1/4	7 1/4	7 1/2	7 1/2	7 1/2	8	8 1/4	8 3/8	8 3/8
O	9 1/16	9 11/16	10 5/16	10 3/8	11	11 1/2	10 7/8	11 1/2	12	12 1/2

Order by Figure Number.

HANGERS

Grinnell Two-Pipe Adjustable Brackets

Cast Iron

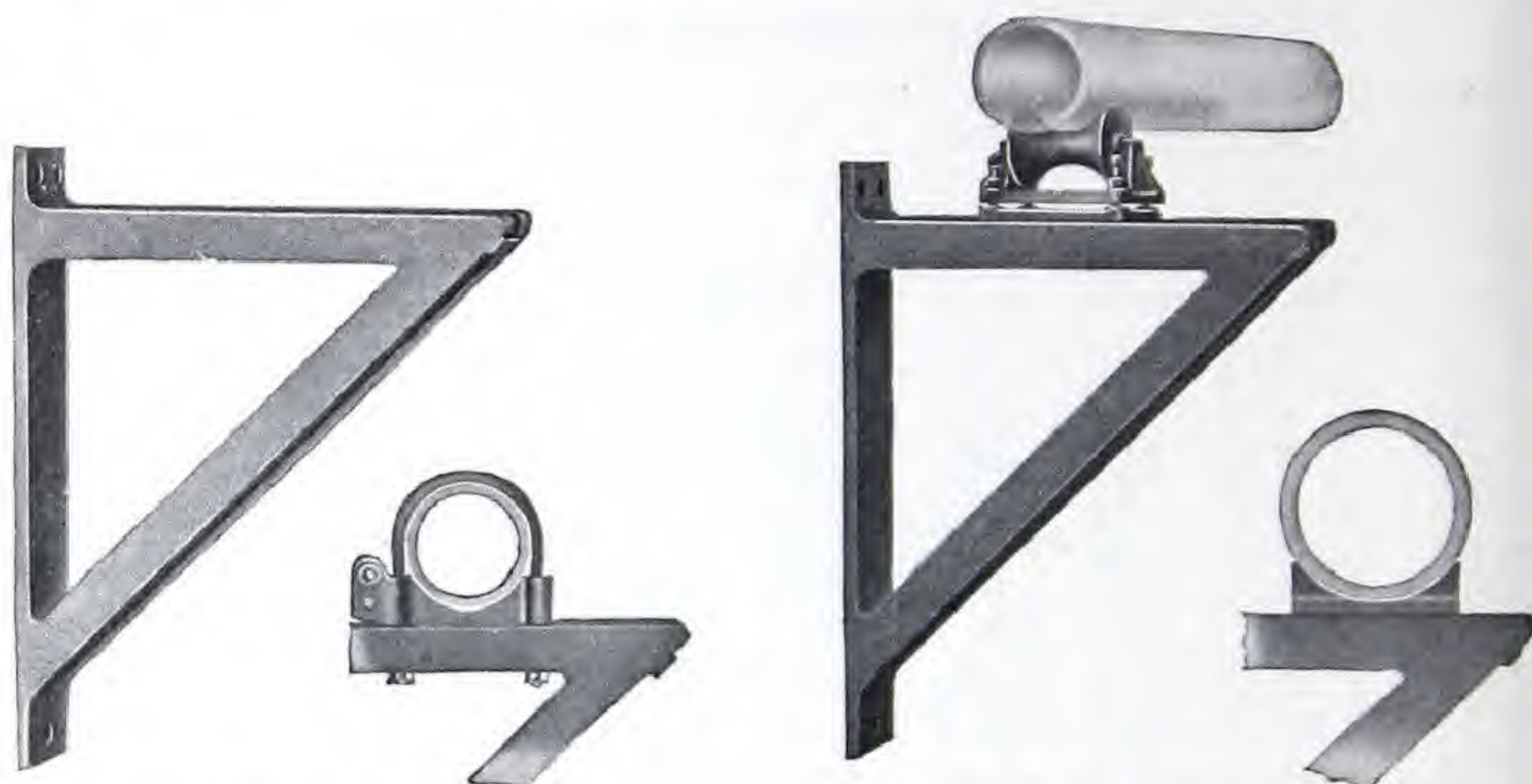
LARGE PIPE ON TOP—Fig. No. 176—(Continued)

Top Pipe Size	4½	4½	4½	4½	4½	5	5	5	5
Bottom Pipe Size	2½	3	3½	4	4½	2½	3	3½	4
Price Ea.	\$6.50	6.50	6.50	6.50	6.50	6.00	6.00	6.00	6.00
A	3½	3½	3½	3½	3½	3¾	3¾	3¾	3¾
B	7⅞	7⅞	7⅞	7⅞	7⅞	8⅝	8⅝	8⅝	8⅝
C	8¾	8¾	8¾	8¾	8¾	9¼	9¼	9¼	9¼
D	5⅞	5⅞	5⅞	5⅞	5⅞	5⅞	5⅞	5⅞	5⅞
E	2⅝	2⅝	2⅝	2⅝	2⅝	2	2	2	2
F	8⅞	8⅞	8⅞	8⅞	8⅞	9⅞	9⅞	9⅞	9⅞
G	6	6	6	6	6	6⅞	6⅞	6⅞	6⅞
H	10⅞	10⅞	10⅞	10⅞	11⅞	10¾	11⅞	11⅞	11⅞
J	12⅞	13⅞	14⅞	14⅞	15⅞	13⅞	14⅞	15	15⅞
K	13⅞	14⅞	15⅞	15⅞	16⅞	14½	15⅞	15¾	16½
L	1½	1½	1½	5⅞	5⅞	1½	1½	1½	5⅞
M	2⅞	2⅞	2⅞	2⅞	2⅞	2⅞	2⅞	2	2
N	8¾	8¾	8⅞	8⅞	8⅞	9⅞	9⅞	9⅞	9⅞
O	11½	12½	12⅞	13½	13⅞	12⅞	12⅞	13⅞	13⅞

Top Pipe Size	5	5	6	6	6	6	6	6	6
Bottom Pipe Size	4½	5	2½	3	3½	4	4½	5	6
Price Ea.	\$6.50	6.50	6.25	6.25	6.25	6.50	6.50	6.50	6.75
A	3¾	3¾	4⅞	4⅞	4⅞	4⅞	4⅞	4⅞	4⅞
B	8⅝	8⅝	9⅞	9⅞	9⅞	9⅞	9⅞	9⅞	9⅞
C	9¼	9¼	10½	10½	10½	10½	10½	10½	10½
D	5⅞	5⅞	3¼	3¼	3¼	3¼	3¼	3¼	3¼
E	2	2	1¼	1¼	1¼	1¼	1¼	1¼	1¼
F	9⅞	9⅞	11	11	11	11	11	11	11
G	6⅞	6⅞	7⅞	7⅞	7⅞	7⅞	7⅞	7⅞	7⅞
H	11⅞	12⅞	11⅞	12¼	12½	12¾	13	13⅞	13⅞
J	16⅞	16⅞	14⅞	15½	16⅞	16¾	17⅞	18⅞	19⅞
K	17	17⅞	15½	16¼	16⅞	17⅞	18⅞	18¾	20
L	5⅞	5⅞	1½	1½	1½	5⅞	5⅞	5⅞	¾
M	2	2	1⅞	1⅞	1⅞	1⅞	1⅞	1⅞	1¼
N	9⅞	9⅞	10⅞	10⅞	10¾	10¾	10¾	10¾	11
O	14⅞	14⅞	13⅞	14	14½	15	15½	16⅞	17⅞

Order by Figure Number.

HANGERS

Grinnell Welded Steel Brackets and Attachments

Welded Steel Bracket Anchor Chair
Fig. No. 199 Fig. No. 197

Adjustable Pipe Stand Pipe Seat
Fig. No. 196 Fig. No. 198

Grinnell Welded Steel Brackets are light in weight as compared with the usual cast iron brackets. Top of bracket and supporting brace are constructed of two angle irons with one-inch space between.

All sizes of the bracket are designed to support a load of 3,000 pounds.

When brackets are to be bolted to walls, Back Plates must be ordered of such size and thickness as to properly distribute the weight over the wall. Size and thickness of back plates will, of course, be governed by the load to be carried and the nature and condition of the wall.

In addition to back plates, it may be necessary in some cases to insert a steel plate or angle iron in the wall on which the upper bolts can rest, in order to spread the load over a greater wall area.

Unless otherwise specified, holes will be drilled in brackets in accordance with drawing and dimension table on opposite page.

We are in a position to furnish on order practically any size or type of welded steel brackets. Prices will be furnished on application. Applications must be accompanied by sketch or print showing all essential dimensions and necessary details.

Brackets are coated with a protective paint to prevent rust during shipment.

List prices on opposite page do not include back plates, bolts and nuts.

HANGERS

Grinnell Welded Steel Brackets

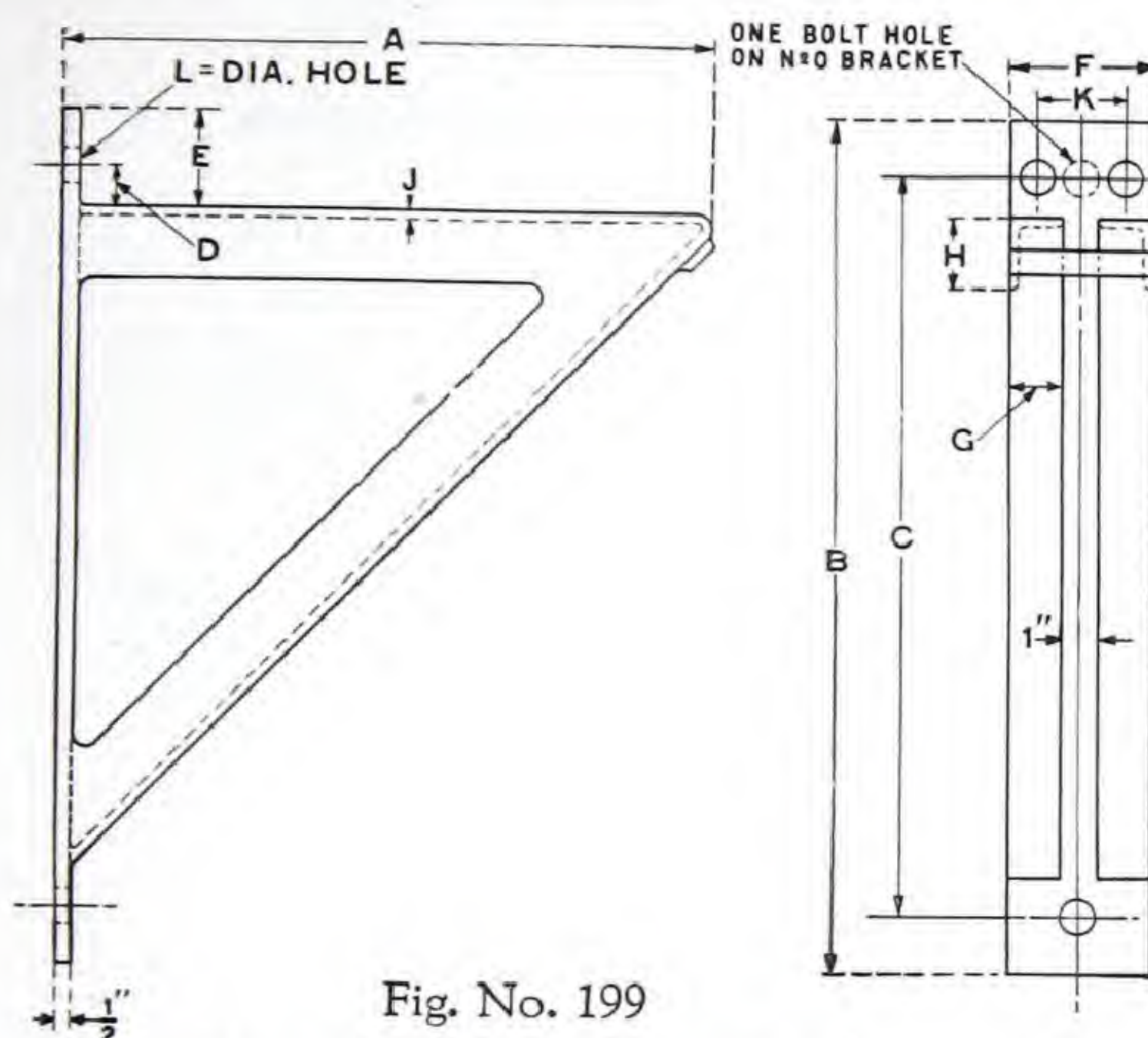


Fig. No. 199

Maximum Load—3,000 Pounds.

LIST PRICES AND DIMENSIONS

BRACKET No.	PRICE EACH Bracket Only Revised Jan. 30, 1925	DIMENSIONS										
		A	B	C	D	E	F	G	H	J	K	L
0	\$15.00	12	18	15 $\frac{1}{4}$	11 $\frac{1}{4}$	2 $\frac{3}{4}$	4	1 $\frac{1}{2}$	2	$\frac{1}{4}$	..	$\frac{13}{16}$
1	17.00	18	24	21 $\frac{3}{8}$	13 $\frac{3}{8}$	2 $\frac{3}{4}$	5	2	2	$\frac{3}{8}$	2 $\frac{3}{4}$	$\frac{15}{16}$
2	20.00	24	30	27 $\frac{1}{2}$	11 $\frac{1}{2}$	2 $\frac{3}{4}$	5	2	2 $\frac{1}{2}$	$\frac{5}{16}$	2 $\frac{1}{2}$	1 $\frac{1}{16}$
3	22.00	30	36	33 $\frac{1}{4}$	11 $\frac{1}{2}$	3	5	2	2 $\frac{1}{2}$	$\frac{5}{16}$	2 $\frac{1}{2}$	1 $\frac{1}{16}$
4	30.00	36	42	39	1 $\frac{1}{2}$	3	6	2 $\frac{1}{2}$	3 $\frac{1}{2}$	$\frac{3}{8}$	3 $\frac{1}{2}$	1 $\frac{1}{16}$
5	36.00	42	50	46	1 $\frac{1}{2}$	3 $\frac{1}{2}$	6	2 $\frac{1}{2}$	3 $\frac{1}{2}$	$\frac{3}{8}$	3 $\frac{1}{2}$	1 $\frac{1}{16}$

INSTRUCTIONS FOR ORDERING

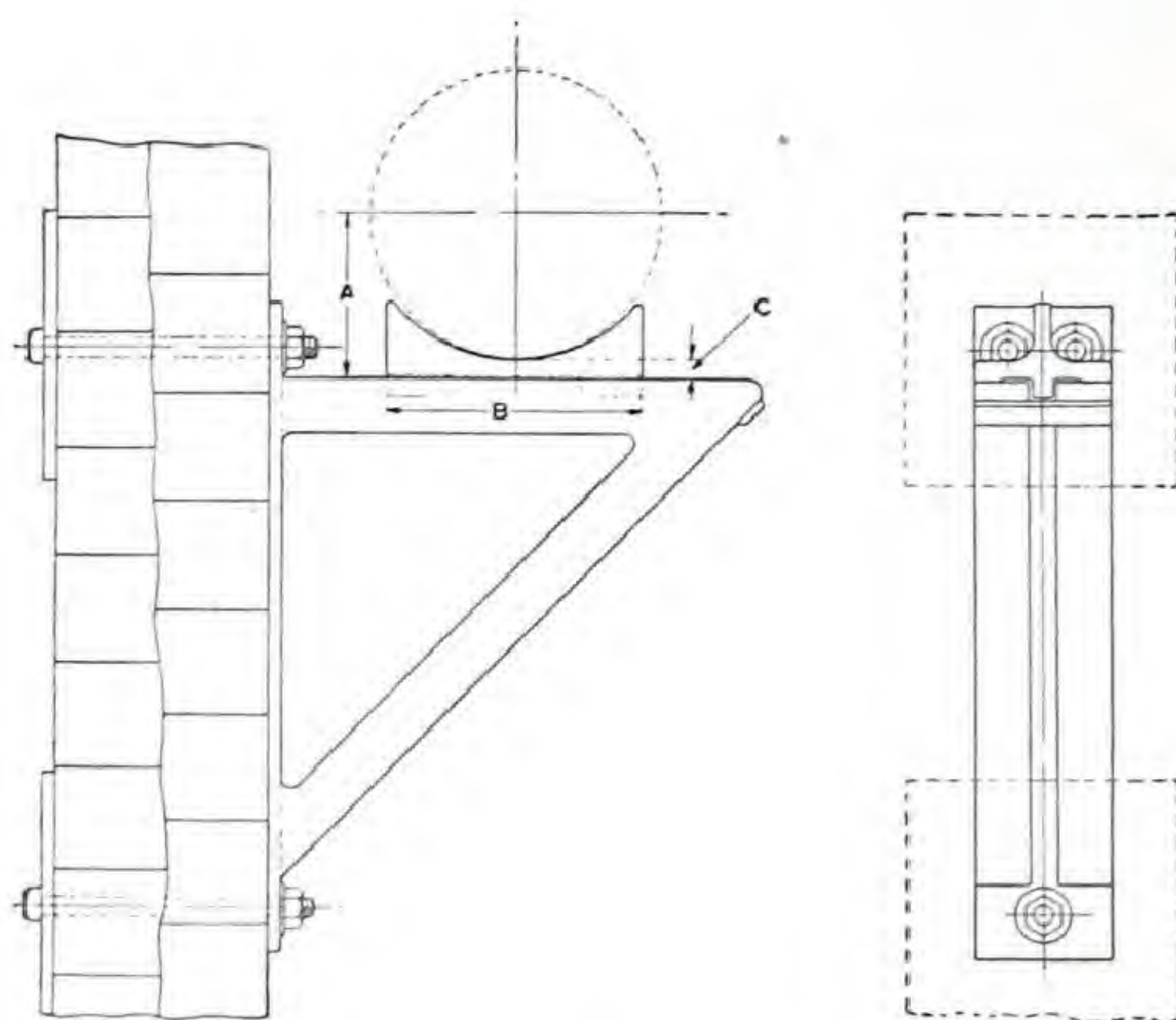
To order specify:

...(Quantity) No. () Welded Steel Brackets, Fig. No. 199.

Note:—Order separately, the bolts and nuts and back plates for fastening the brackets to wall, specifying the size and length of bolts and the size, thickness and drilling of the plates.

HANGERS

Grinnell Pipe Seats
With Welded Steel Brackets



Application of Pipe Seat with Welded Steel Bracket

Pipe Seat Only—Fig. No. 198

LIST PRICES AND DIMENSIONS—Fig. No. 198

Pipe Size	4	4½	5	6	7	8	9	10	12
Price Each	\$1.50	1.50	1.75	2.00	2.50	2.50	3.00	3.50	4.50
A	2 13/16	3 1/16	3 3/8	3 15/16	4 7/16	5 1/16	5 9/16	6 1/8	7 1/8
B	4 1/2	5	5 1/4	6 1/4	7 1/8	8	8 3/4	9 3/8	11
C	9/16	9/16	9/16	5/8	5/8	3/4	3/4	3/4	3/4

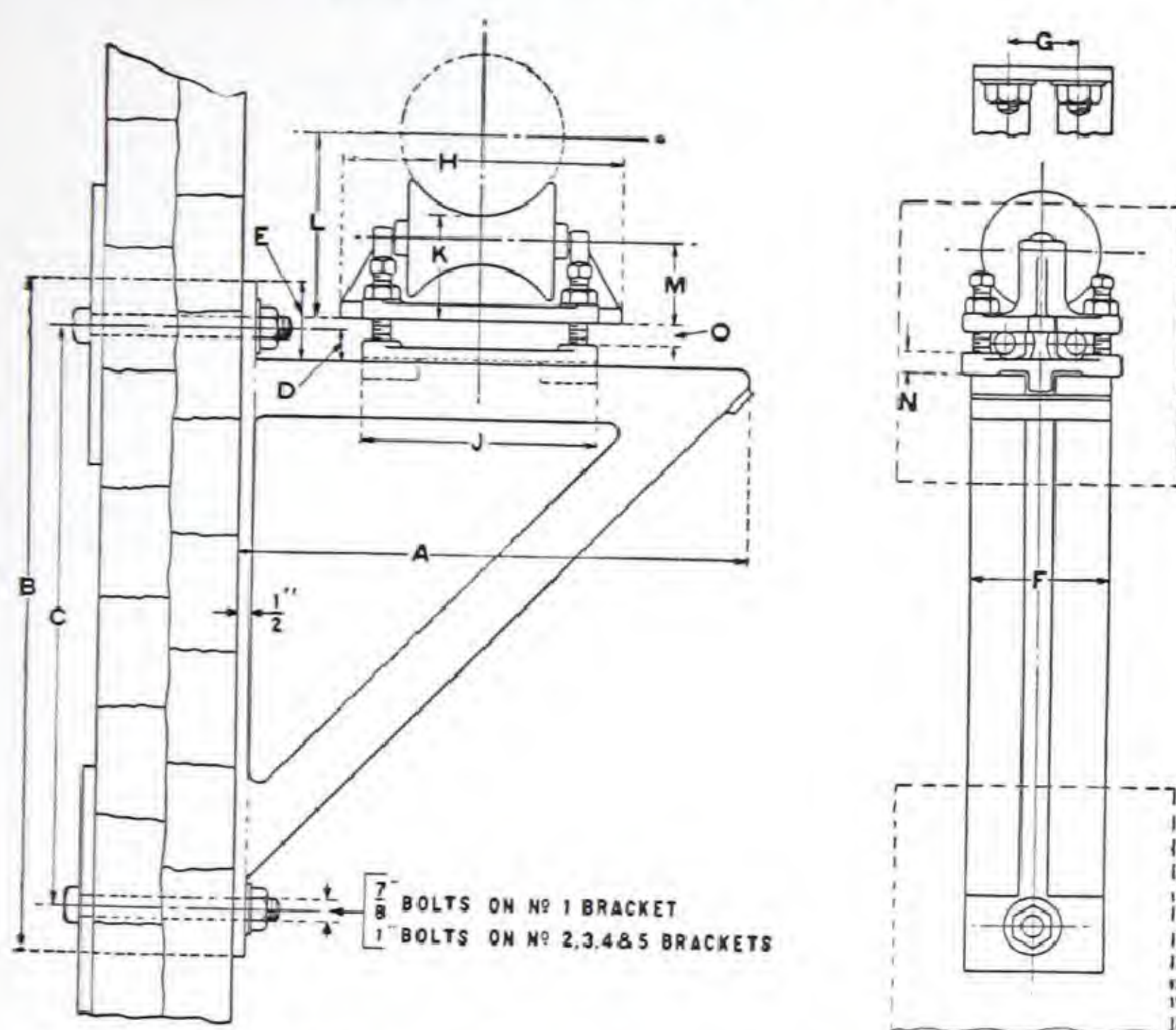
Grinnell Pipe Seats are designed to offer as little resistance to expansion and contraction as possible and yet are strong enough to carry a heavy weight and resist vibration. They are larger and conform to a greater portion of the circumference of the pipe than those of most manufacturers.

This feature minimizes the danger of pipe "jumping out" of the seat.
 Wherever installed this hanger presents a neat and workmanlike job.

Order by Figure Number.

HANGERS

Grinnell Adjustable Pipe Stands With Welded Steel Brackets



Application of Adjustable Pipe Stand with Welded Steel Bracket
Adjustable Pipe Stand Only—Fig. No. 196

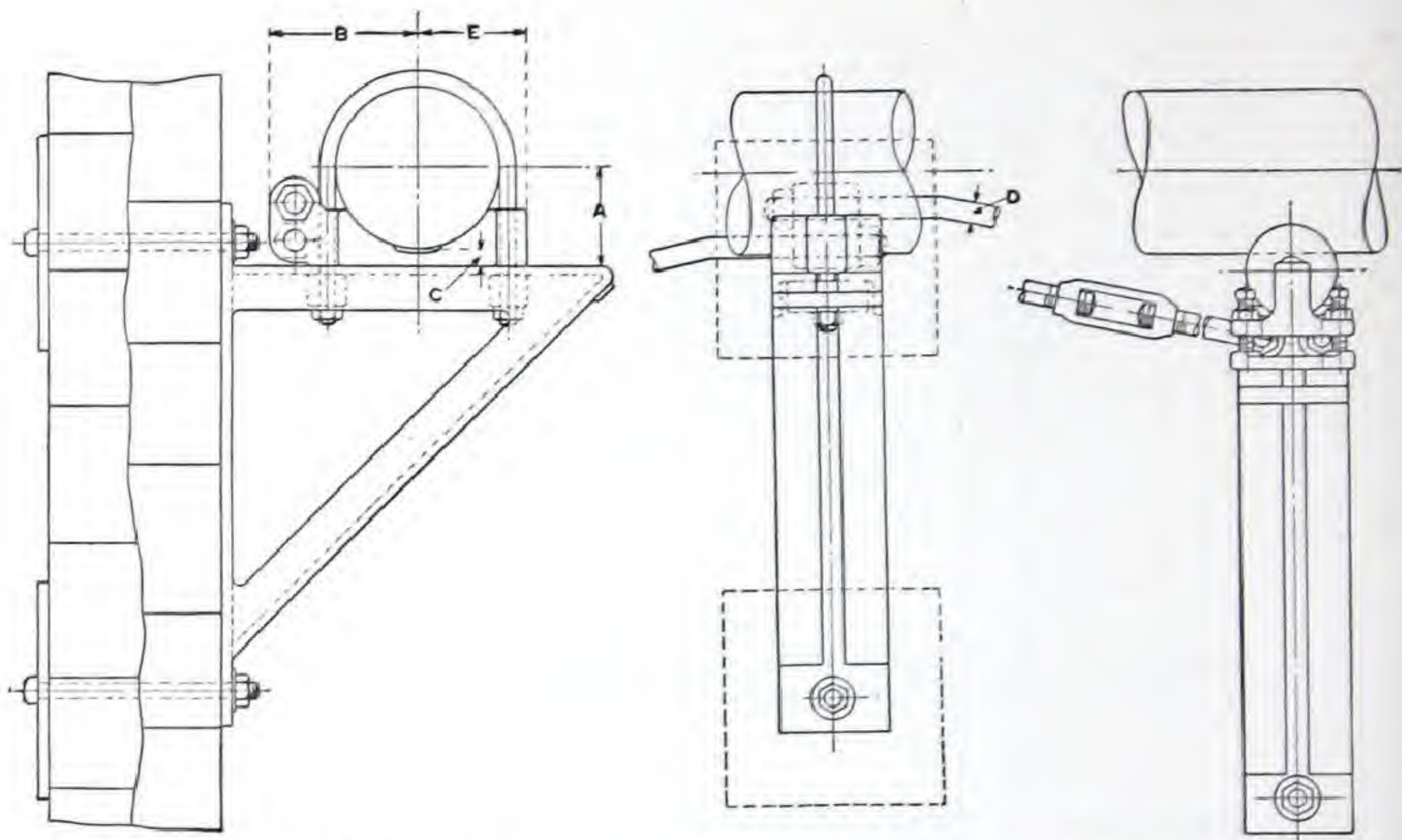
LIST PRICES AND DIMENSIONS—Fig. No. 196

Pipe Size	Price Each	H	J	K	L	M	N	Max. O
3	\$ 5.00	8 $\frac{5}{16}$	7 $\frac{3}{16}$	3 $\frac{1}{4}$	5	2 $\frac{1}{2}$	$\frac{13}{16}$	1 $\frac{3}{16}$
3 $\frac{1}{2}$	5.00	8 $\frac{5}{16}$	7 $\frac{3}{16}$	3 $\frac{1}{4}$	5 $\frac{1}{4}$	2 $\frac{1}{2}$	$\frac{13}{16}$	1 $\frac{3}{16}$
4	6.00	8 $\frac{5}{16}$	7 $\frac{3}{16}$	3 $\frac{1}{4}$	5 $\frac{1}{2}$	2 $\frac{1}{2}$	$\frac{13}{16}$	1 $\frac{3}{16}$
4 $\frac{1}{2}$	7.00	9 $\frac{3}{16}$	7 $\frac{13}{16}$	3 $\frac{5}{8}$	6 $\frac{1}{8}$	2 $\frac{13}{16}$	$\frac{13}{16}$	1 $\frac{3}{16}$
5	8.00	9 $\frac{15}{16}$	8 $\frac{5}{16}$	3 $\frac{13}{16}$	6 $\frac{5}{8}$	2 $\frac{15}{16}$	$\frac{13}{16}$	1 $\frac{3}{16}$
6	9.00	11 $\frac{5}{8}$	9 $\frac{1}{2}$	4 $\frac{1}{4}$	7 $\frac{9}{16}$	3 $\frac{5}{16}$	$\frac{7}{8}$	1 $\frac{3}{8}$
7	10.00	12 $\frac{5}{8}$	10 $\frac{1}{8}$	4 $\frac{13}{16}$	8 $\frac{5}{8}$	3 $\frac{3}{4}$	$\frac{7}{8}$	1 $\frac{3}{8}$
8	14.00	14 $\frac{3}{8}$	11 $\frac{3}{4}$	5 $\frac{1}{2}$	9 $\frac{13}{16}$	4 $\frac{1}{4}$	1	1 $\frac{5}{8}$
9	16.00	15 $\frac{3}{4}$	12 $\frac{1}{2}$	6 $\frac{1}{16}$	10 $\frac{7}{8}$	4 $\frac{11}{16}$	1	1 $\frac{5}{8}$
10	20.00	17 $\frac{1}{2}$	13 $\frac{5}{8}$	6 $\frac{9}{16}$	11 $\frac{15}{16}$	5 $\frac{1}{16}$	1	1 $\frac{5}{8}$
12	25.00	19 $\frac{7}{8}$	15 $\frac{3}{4}$	7 $\frac{7}{16}$	13 $\frac{13}{16}$	5 $\frac{13}{16}$	1	2
14	27.00	19 $\frac{7}{8}$	15 $\frac{3}{4}$	7 $\frac{7}{16}$	14 $\frac{7}{16}$	5 $\frac{13}{16}$	1	2
15	30.00	21	17 $\frac{1}{8}$	7 $\frac{1}{2}$	15	5 $\frac{3}{4}$	1 $\frac{1}{8}$	1 $\frac{3}{4}$
16	33.00	21	17 $\frac{1}{8}$	7 $\frac{5}{8}$	15 $\frac{5}{8}$	5 $\frac{3}{4}$	1 $\frac{1}{8}$	1 $\frac{3}{4}$
18	42.00	21	17 $\frac{1}{8}$	7 $\frac{5}{8}$	16 $\frac{5}{8}$	5 $\frac{3}{4}$	1 $\frac{1}{8}$	1 $\frac{3}{4}$
20	50.00	21	17 $\frac{1}{8}$	7 $\frac{5}{8}$	17 $\frac{5}{8}$	5 $\frac{3}{4}$	1 $\frac{1}{8}$	1 $\frac{3}{4}$

Order by Figure Number.

HANGERS

Grinnell Anchor Chairs
With Welded Steel Brackets



Application of Anchor Chair
with Welded Steel Bracket
Anchor Chair Only
Fig. No. 197

Showing Method
of Attaching
Anchor Rods to
Anchor Chair

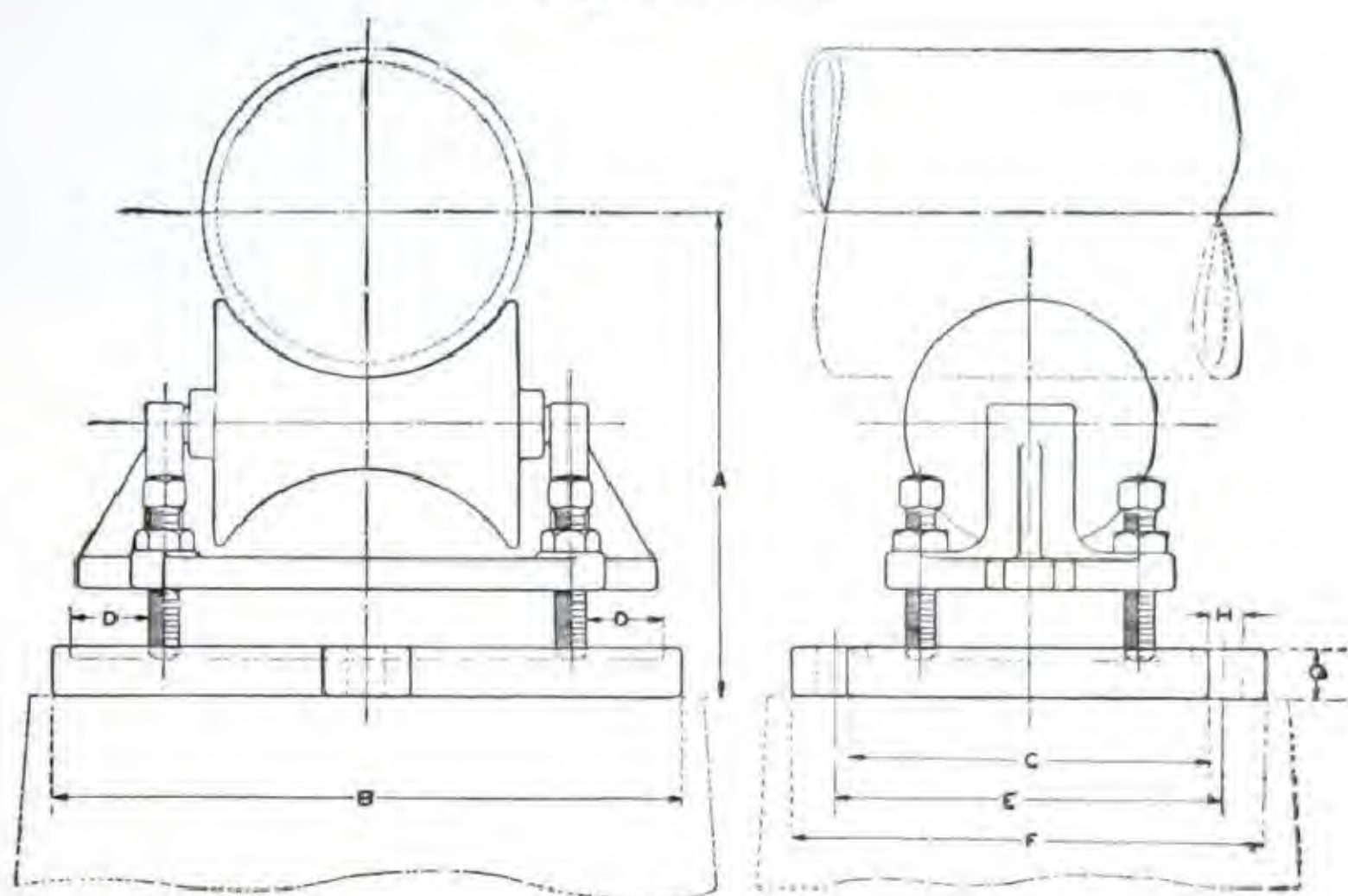
Showing Method of
Attaching Anchor Rod to
Wall Bolt of Adjoining
Bracket.

LIST PRICES AND DIMENSIONS—Fig. No. 197

Pipe Size	Price Each	A	B	C	D	E
4	\$ 4.50	3	4 1/8	3/4	5/8	3 3/16
5	5.50	3 5/8	5	13/16	3/4	3 7/8
6	7.50	4 1/16	5 3/4	3/4	7/8	4 9/16
7	9.00	4 5/8	6 1/2	13/16	1	5 1/16
8	11.00	5 5/16	7 1/8	1	1	5 3/4
9	12.00	5 7/8	7 3/4	1 1/2	1 1/8	6 1/4
10	14.00	6 1/2	8 3/8	1 1/8	1 1/8	7
12	20.00	7 5/8	9 1/2	1 1/4	1 1/4	8
14	22.00	8 1/2	10 1/8	1 1/2	1 1/4	8 5/8
16	28.00	9 5/8	11 1/2	1 5/8	1 1/2	9 3/16
18	32.00	10 7/8	12 1/2	1 7/8	1 1/2	10 3/16
20	36.00	12	13 1/2	2	1 1/2	11 3/16

Order by Figure Number.

HANGERS

Grinnell Adjustable Pipe Rolls with Base Plates
Cast IronAdjustable Pipe Roll with Base Plate
Fig. No. 185

LIST PRICES AND DIMENSIONS—Fig. No. 185

Pipe Size	Price Each	A		B	C	D	E	F	G	H
		Min.	Max.							
3	\$5.50	6	7 $\frac{1}{4}$	9 $\frac{3}{8}$	6 $\frac{3}{8}$	1	6 $\frac{7}{8}$	8 $\frac{5}{8}$	1	3 $\frac{1}{4}$
3 $\frac{1}{2}$	5.50	6 $\frac{1}{4}$	7 $\frac{1}{2}$	9 $\frac{3}{8}$	6 $\frac{3}{8}$	1	6 $\frac{7}{8}$	8 $\frac{5}{8}$	1	3 $\frac{1}{4}$
4	6.50	6 $\frac{1}{2}$	7 $\frac{3}{4}$	9 $\frac{3}{8}$	6 $\frac{3}{8}$	1	6 $\frac{7}{8}$	8 $\frac{5}{8}$	1	3 $\frac{1}{4}$
4 $\frac{1}{2}$	7.00	7 $\frac{1}{8}$	8 $\frac{3}{8}$	10 $\frac{5}{16}$	6 $\frac{5}{8}$	1	7 $\frac{1}{8}$	8 $\frac{7}{8}$	1	3 $\frac{1}{4}$
5	7.75	7 $\frac{5}{8}$	8 $\frac{7}{8}$	10 $\frac{5}{16}$	6 $\frac{5}{8}$	1	7 $\frac{1}{8}$	8 $\frac{7}{8}$	1	3 $\frac{1}{4}$
6	9.50	8 $\frac{1}{8}$	10	12 $\frac{5}{8}$	7 $\frac{1}{4}$	1 $\frac{1}{4}$	7 $\frac{3}{4}$	9 $\frac{1}{2}$	1	3 $\frac{1}{4}$
7	11.00	9 $\frac{5}{8}$	11 $\frac{1}{8}$	12 $\frac{5}{8}$	7 $\frac{1}{4}$	1 $\frac{1}{4}$	7 $\frac{3}{4}$	9 $\frac{1}{2}$	1	3 $\frac{1}{4}$
8	17.00	11	12 $\frac{5}{8}$	15	8	1 $\frac{1}{4}$	8 $\frac{1}{2}$	10 $\frac{1}{4}$	1 $\frac{3}{16}$	3 $\frac{1}{4}$
9	18.50	12 $\frac{1}{4}$	13 $\frac{7}{8}$	15	8	1 $\frac{1}{4}$	8 $\frac{1}{2}$	10 $\frac{1}{4}$	1 $\frac{3}{16}$	3 $\frac{1}{4}$
10	22.00	13 $\frac{1}{8}$	14 $\frac{3}{4}$	16 $\frac{5}{8}$	8 $\frac{5}{8}$	1 $\frac{1}{2}$	9 $\frac{1}{8}$	10 $\frac{7}{8}$	1 $\frac{3}{16}$	3 $\frac{1}{4}$
12	27.00	15 $\frac{3}{16}$	17 $\frac{3}{16}$	18 $\frac{3}{4}$	9 $\frac{3}{8}$	1 $\frac{1}{2}$	9 $\frac{7}{8}$	11 $\frac{5}{8}$	1 $\frac{3}{8}$	3 $\frac{1}{4}$
14	29.00	15 $\frac{13}{16}$	17 $\frac{13}{16}$	18 $\frac{3}{4}$	9 $\frac{3}{8}$	1 $\frac{1}{2}$	9 $\frac{7}{8}$	11 $\frac{5}{8}$	1 $\frac{3}{8}$	3 $\frac{1}{4}$
15	35.00	16 $\frac{1}{2}$	18 $\frac{1}{4}$	20 $\frac{1}{2}$	10 $\frac{1}{4}$	1 $\frac{3}{4}$	10 $\frac{3}{4}$	12 $\frac{1}{2}$	1 $\frac{1}{2}$	3 $\frac{1}{4}$
16	37.00	17 $\frac{1}{8}$	18 $\frac{7}{8}$	20 $\frac{1}{2}$	10 $\frac{1}{4}$	1 $\frac{3}{4}$	10 $\frac{3}{4}$	12 $\frac{1}{2}$	1 $\frac{1}{2}$	3 $\frac{1}{4}$
18	45.00	18 $\frac{1}{8}$	19 $\frac{7}{8}$	20 $\frac{1}{2}$	10 $\frac{1}{4}$	1 $\frac{3}{4}$	10 $\frac{3}{4}$	12 $\frac{1}{2}$	1 $\frac{1}{2}$	3 $\frac{1}{4}$
20	52.00	19 $\frac{1}{8}$	20 $\frac{7}{8}$	20 $\frac{1}{2}$	10 $\frac{1}{4}$	1 $\frac{3}{4}$	10 $\frac{3}{4}$	12 $\frac{1}{2}$	1 $\frac{1}{2}$	3 $\frac{1}{4}$

This pipe support is adjustable both vertically and laterally. Vertical adjustment is obtained by turning adjusting bolts located on four corners of stand. Lateral adjustment can be secured by simply sliding Adjustable Pipe Stand on ends of bolts.

Order by Figure Number.

HANGERS

Grinnell Pipe Rolls and Plates—Pipe Roll Chairs

Cast Iron

Pipe Roll and Plate
Fig. No. 180Pipe Roll Chair
Fig. No. 177

LIST PRICES

Pipe Size.....Inches	4-6	7-10	12-15	16-18
Roll and Plate Complete, Fig. No. 180.....Each	\$2.25	4.25	6.00	7.75
Plate Only, Fig. No. 181.....Each	1.35	2.25	2.90	3.65
Roll Only, Fig. No. 182.....Each	.90	2.00	3.10	5.10

LIST PRICES

Pipe Size.....Inches	2	2½	3	3½	4	4½	5	6	7
Roll and Chair Complete. Fig. No. 177.....Each	\$0.35	.40	.50	.60	.80	.95	1.00	1.40	1.60
Roll Chair Only. Fig. No. 178.....Each	.20	.25	.35	.40	.60	.70	.75	1.10	1.25
Roll Only. Fig. No. 179.....Each	.15	.15	.15	.20	.20	.25	.25	.30	.35

Pipe Size.....Inches	8	9	10	12	14	15	16	18	..
Roll and Chair Complete. Fig. No. 177.....Each	\$2.00	2.75	4.00	5.50	7.25	10.50	14.00	18.00	..
Roll Chair Only. Fig. No. 178.....Each	1.50	1.75	2.50	3.50	4.50	6.00	8.50	12.00	..
Roll Only. Fig. No. 179.....Each	.50	1.00	1.50	2.00	2.75	4.50	5.50	6.00	..

Grinnell Pipe Roll Chairs, and Pipe Rolls and Plates, are for use in supporting piping when adjustment is not necessary but where provision must be made for expansion and contraction.

They are similar to Pipe Chairs but can be put to more varied use. For instance, they may be used for High Pressure Steam, Blow-Off Lines and other pipe lines where a pipe support is required.

Actual adjustment of the chair itself is not possible but in case of necessity they can be raised or lowered by blocking or shimming up the support or base.

Order by Figure Number.

HANGERS

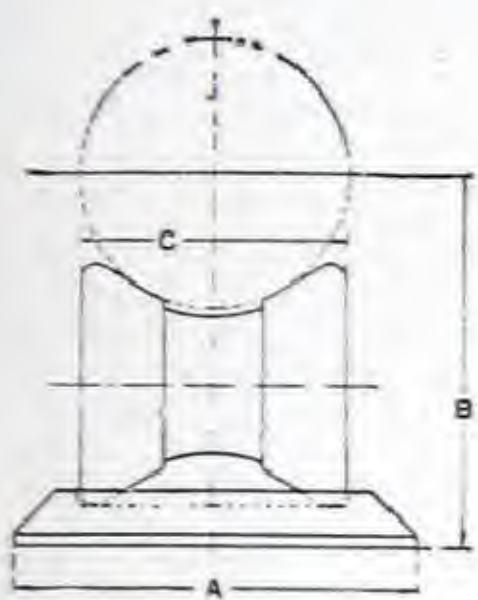
Grinnell Pipe Rolls and Plates—Pipe Roll Chairs
Cast Iron

Fig. No. 180

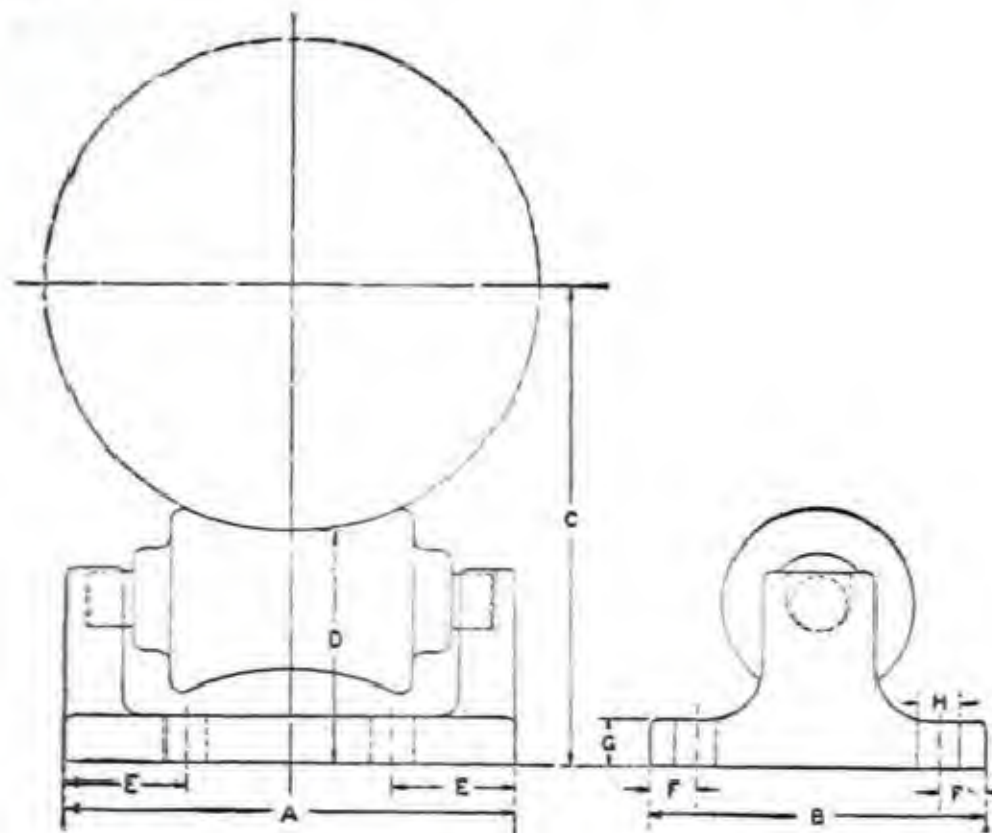
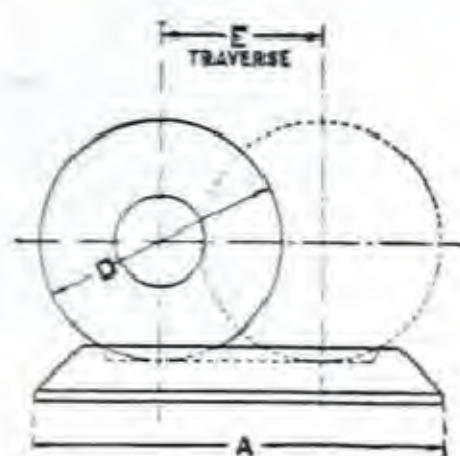


Fig. No. 177

DIMENSIONS—Fig. No. 180

Size	Pipe Size	A	B	C	D	E
4-6	4	$6\frac{3}{4}$	$6\frac{1}{4}$	$4\frac{3}{8}$	4	$2\frac{3}{4}$
	5		$6\frac{7}{8}$			
	6		$7\frac{1}{2}$			
7-10	7	$9\frac{3}{4}$	$8\frac{1}{8}$	$6\frac{5}{8}$	$5\frac{7}{16}$	$4\frac{1}{2}$
	8		$9\frac{5}{8}$			
	9		$10\frac{1}{4}$			
	10		$10\frac{7}{8}$			
12-15	12	$12\frac{1}{2}$	$12\frac{3}{8}$	$8\frac{5}{8}$	$6\frac{3}{16}$	6
	14		$13\frac{1}{8}$			
	15		$13\frac{5}{8}$			
16-18	16	15	$14\frac{7}{8}$	$10\frac{7}{8}$	$7\frac{1}{2}$	8
	18		16			

DIMENSIONS—Fig. No. 177

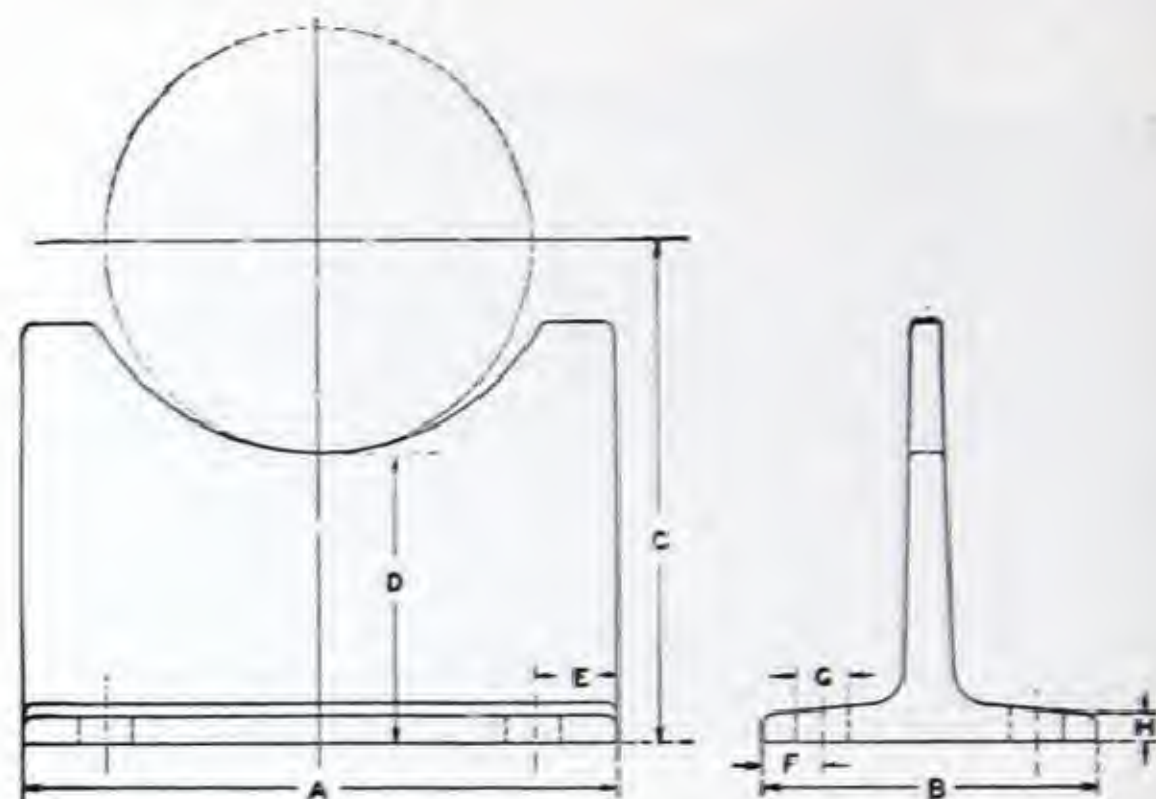
Pipe Size Inches	A	B	C	D	E	F	G	Diam. of Hole H
2	$2\frac{7}{8}$	$2\frac{7}{8}$	3	$1\frac{13}{16}$	$1\frac{1}{8}$	$\frac{1}{2}$	$\frac{3}{8}$	$\frac{7}{16}$
$2\frac{1}{2}$	$3\frac{5}{16}$	$3\frac{1}{8}$	$3\frac{9}{16}$	$2\frac{1}{8}$	$1\frac{1}{4}$	$\frac{1}{2}$	$\frac{7}{16}$	$\frac{7}{16}$
3	$3\frac{5}{8}$	$3\frac{1}{4}$	$3\frac{7}{8}$	$2\frac{1}{8}$	$1\frac{1}{4}$	$\frac{1}{2}$	$\frac{7}{16}$	$\frac{7}{16}$
$3\frac{1}{2}$	$3\frac{15}{16}$	$3\frac{1}{4}$	$4\frac{7}{16}$	$2\frac{7}{16}$	$1\frac{1}{4}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{7}{16}$
4	$4\frac{1}{2}$	$3\frac{1}{2}$	$4\frac{13}{16}$	$2\frac{9}{16}$	$1\frac{1}{2}$	$\frac{5}{8}$	$\frac{9}{16}$	$\frac{9}{16}$
$4\frac{1}{2}$	$4\frac{3}{4}$	$3\frac{3}{4}$	$5\frac{1}{8}$	$2\frac{5}{8}$	$1\frac{1}{2}$	$\frac{5}{8}$	$\frac{9}{16}$	$\frac{9}{16}$
5	$4\frac{15}{16}$	4	$5\frac{5}{8}$	$2\frac{13}{16}$	$1\frac{1}{2}$	$\frac{5}{8}$	$\frac{9}{16}$	$\frac{9}{16}$
6	6	$4\frac{1}{2}$	$6\frac{7}{16}$	$3\frac{1}{8}$	$1\frac{5}{8}$	$\frac{5}{8}$	$\frac{5}{8}$	$\frac{9}{16}$
7	$6\frac{3}{8}$	5	$7\frac{3}{16}$	$3\frac{3}{8}$	$1\frac{5}{8}$	$\frac{5}{8}$	$\frac{5}{8}$	$\frac{9}{16}$
8	$7\frac{1}{4}$	$5\frac{1}{2}$	$8\frac{1}{4}$	$3\frac{15}{16}$	2	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{11}{16}$
9	$7\frac{5}{8}$	6	$9\frac{1}{16}$	$4\frac{1}{4}$	2	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{11}{16}$
10	$8\frac{1}{16}$	$6\frac{1}{2}$	$9\frac{15}{16}$	$4\frac{9}{16}$	2	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{11}{16}$
12	9	$7\frac{1}{2}$	$11\frac{15}{16}$	$4\frac{15}{16}$	$1\frac{1}{2}$	1	$\frac{3}{4}$	$\frac{11}{16}$
14	$9\frac{3}{4}$	8	$12\frac{1}{16}$	$5\frac{1}{16}$	$1\frac{1}{2}$	1	$\frac{3}{4}$	$\frac{11}{16}$
15	$10\frac{1}{4}$	$8\frac{1}{2}$	$12\frac{5}{8}$	$5\frac{1}{8}$	$1\frac{1}{2}$	1	$\frac{3}{4}$	$\frac{11}{16}$
16	$10\frac{7}{8}$	9	$13\frac{5}{8}$	$5\frac{5}{8}$	$1\frac{1}{2}$	1	$\frac{7}{8}$	$\frac{3}{4}$
18	$12\frac{1}{8}$	$9\frac{1}{2}$	15	6	$1\frac{1}{2}$	1	1	$\frac{3}{4}$

Order by Figure Number.

HANGERS

Grinnell Pipe Chairs

Cast Iron

Pipe Chair
Fig. No. 183

Two Holes Diagonally Across Bottom

LIST PRICES AND DIMENSIONS—Fig. No. 183

Pipe Size	Price Each	A	B	C	D	E	F	Hole G	H
2	\$0.30	3½	2⅞	3¾	2 ⁹ / ₁₆	5/8	1/2	7/16	3/8
2½	.40	4¼	3⅛	4 ³ / ₁₆	2¾	¾	1/2	7/16	3/8
3	.67	5	3¼	4 ¹¹ / ₁₆	2 ¹⁵ / ₁₆	¾	1/2	7/16	3/8
3½	.70	5½	3¼	4⅞	2⅞	¾	1/2	7/16	3/8
4	.85	6¼	3½	5 ³ / ₁₆	3 ¹ / ₁₆	7/8	5/8	9/16	7/16
4½	1.20	7	3¾	5¾	3¼	1	5/8	9/16	7/16
5	1.55	7½	4	6	3 ³ / ₁₆	1	5/8	9/16	1/2
6	2.25	8¾	4½	6 ⁷ / ₁₆	3⅛	1	5/8	9/16	1/2
7	2.60	9¾	5	7¼	3 ⁷ / ₁₆	1	5/8	9/16	9/16
8	3.10	10¾	5½	7¾	3 ⁷ / ₁₆	1¼	¾	11/16	9/16
9	3.50	12	6	8¾	3 ⁹ / ₁₆	1¼	¾	11/16	9/16
10	4.70	13	6½	9	3 ⁵ / ₈	1¼	¾	11/16	5/8
12	7.00	15	7½	10½	4⅛	1½	1	11/16	5/8
14	9.70	17	8½	11¾	4¾	1½	1	11/16	11/16
16	14.00	19	9½	13	5	1¾	1¼	11/16	¾
18	16.00	21	10¼	13¾	4¾	2	1¾	11/16	¾
20	20.00	23¼	11½	15	5	2¼	1⅝	11/16	¾

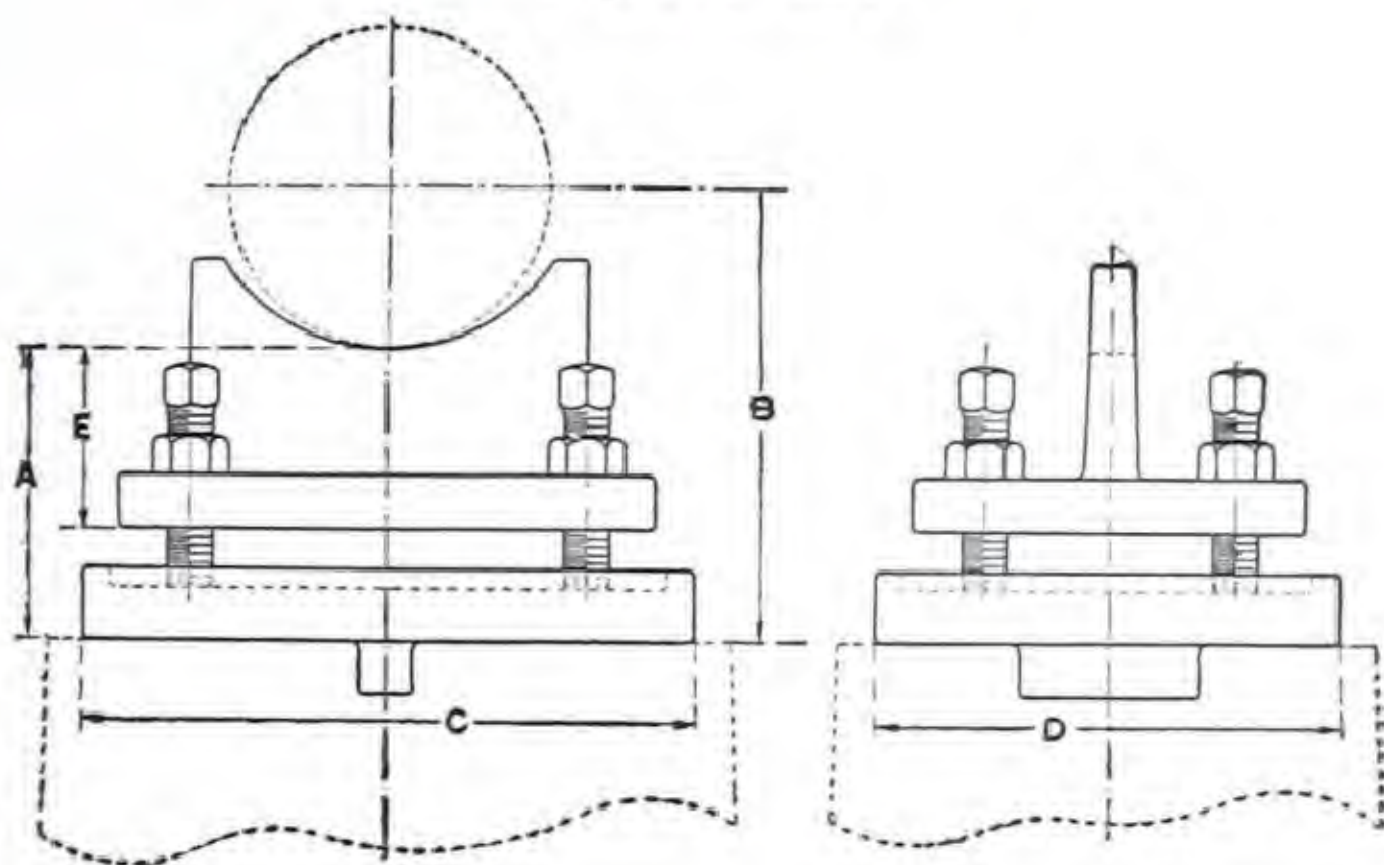
Order by Figure Number.

HANGERS

Grinnell Adjustable Pipe Chairs with Base Plates
Cast Iron



Adjustable Pipe Chair with Base Plate
 Fig. No. 184



LIST PRICES AND DIMENSIONS—Fig. No. 184

Pipe Size	Price Each	A		B		C	D	E
		Min.	Max.	Min.	Max.			
3	\$3.80	3 $\frac{1}{4}$	4 $\frac{3}{16}$	5	5 $\frac{15}{16}$	7 $\frac{1}{4}$	6	2 $\frac{1}{8}$
4	5.30	3 $\frac{5}{8}$	4 $\frac{7}{16}$	5 $\frac{7}{8}$	6 $\frac{11}{16}$	8 $\frac{1}{2}$	6 $\frac{1}{2}$	2 $\frac{1}{2}$
5	7.00	4	4 $\frac{11}{16}$	6 $\frac{13}{16}$	7 $\frac{1}{2}$	10	7	2 $\frac{7}{8}$

This Pipe Chair with Base Plate was designed with complete understanding of the need of a suitable pipe support for Blow Off lines which would be adjustable as well as practical.

The main advantage of this Pipe Chair is, of course, the fact that by adjustment the chair can be brought securely up against pipe or back of fitting after pipe is erected. When thus adjusted it holds pipe line firmly against thrust due to opening of Blow Off connection.

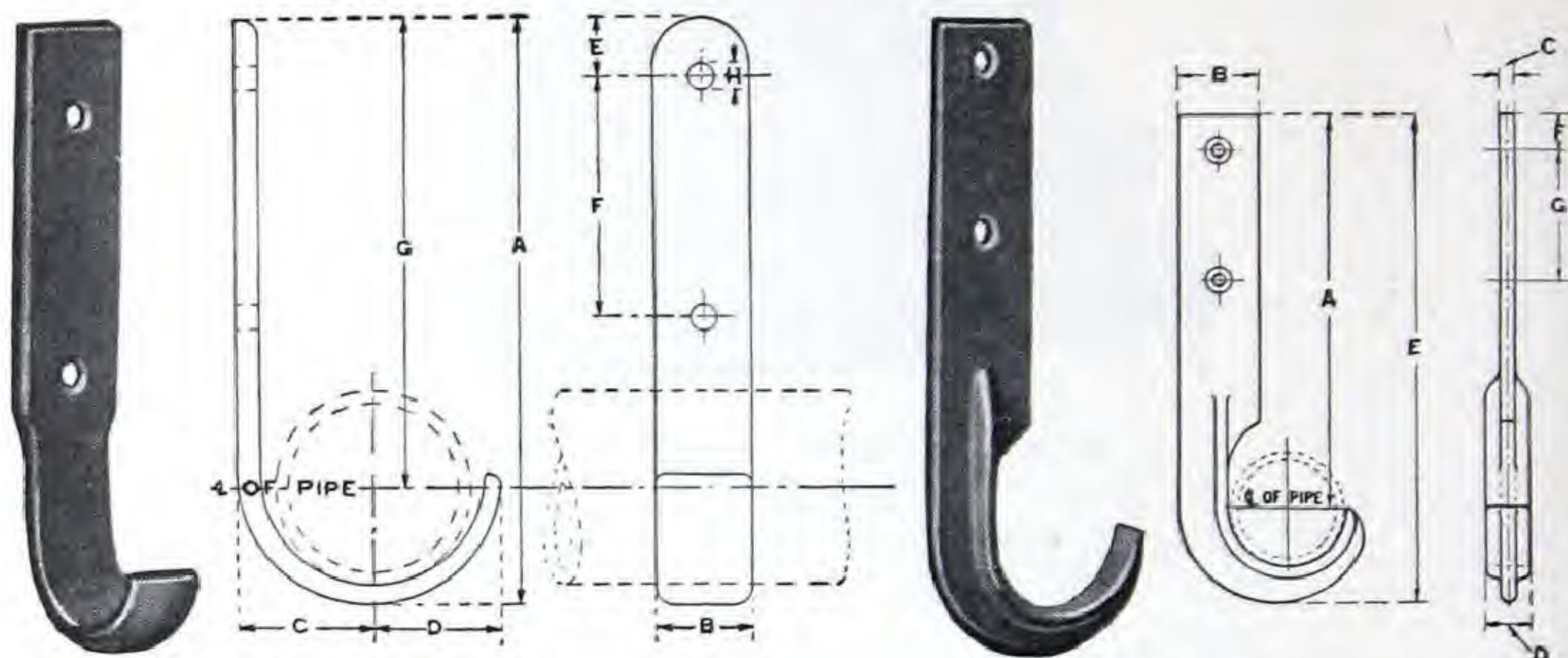
Prices include Chair and Base Plate complete.

Order by Figure Number.

HANGERS

Grinnell Back Beam Hooks—Side Beam Hooks

Malleable Iron

Back Beam Hook
Fig. No. 200Side Beam Hook
Fig. No. 201

LIST PRICES AND DIMENSIONS—Fig. No. 200

Pipe Size	†Price Each	A	B	C	D	E	F	G	Size Screw
1/2	\$0.50	6 3/4	1 1/4	1 1/16	9/16	1	3	6	No. 18
3/4	.55	7 1/4	1 3/8	1 1/8	2 3/8	1 1/8	3	6 7/16	No. 18
1	.65	7 3/4	1 9/16	1 1/8	7/8	1 1/4	3	6 7/8	No. 18
1 1/4	.70	8 5/8	1 3/4	1 3/8	1	1 1/4	3	7 1/2	No. 18
1 1/2	.95	9 5/8	1 7/8	1 3/8	1 1/8	1 1/4	4	8 5/16	No. 18
2	1.10	10 1/2	2	1 3/2	1 1/2	1 1/2	4	8 3/2	No. 18
2 1/2	1.25	11 1/2	2	1 15/16	1 1/16	2	5	9 11/16	No. 18
3	1.45	12 1/4	1 7/8	2 1/4	2	1 5/8	4	10 1/8	No. 18

LIST PRICES AND DIMENSIONS—Fig. No. 201

Pipe Size	†Price Each	A	B	C	D	E	F	G	Size Screw
1/2	\$0.35	7 3/16	1 1/16	3/2	11/16	8 1/16	5/8	2 1/8	No. 18
3/4	.40	7 13/16	1 1/8	1 1/4	3/4	8 3/8	3/4	2 3/16	No. 18
1	.45	7 17/16	1 1/4	1 1/4	3/4	8 5/8	3/4	2 5/16	No. 18
1 1/4	.50	7 23/16	1 3/8	1 1/4	13/16	9 1/8	3/4	2 5/16	No. 18
1 1/2	.75	8 3/8	1 1/2	1 1/4	7/8	9 7/8	3/4	2 9/16	No. 18
2	.90	8 5/16	1 11/16	5/16	15/16	10 1/4	3/4	2 3/4	No. 18
2 1/2	1.05	9 1/16	1 7/8	3/8	1	11 5/16	7/8	2 3/4	No. 18
3	1.25	10 1/16	2	7/16	1 1/16	12 5/8	7/8	2 3/4	No. 18

Back Beam and Side Beam Hooks are particularly adapted for hanging small pipe lines such as gas, air or water piping along walls or on side of beams, etc. They are also used for carrying electric conduits.

Order by Figure Number.

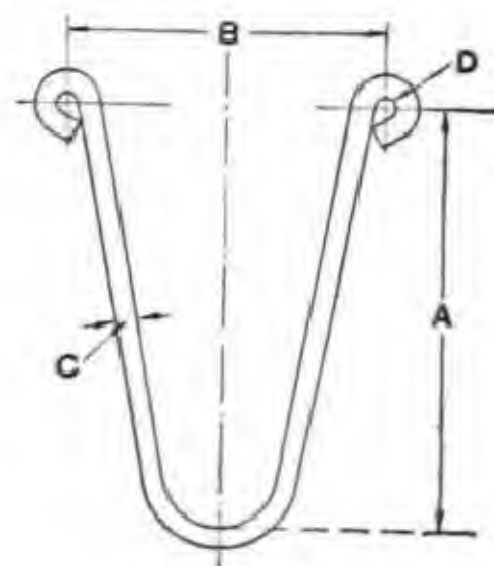
†Revised Lists.

HANGERS

Grinnell U Hooks



U Hook
Fig. No. 205



LIST PRICES AND DIMENSIONS—Fig. No. 205

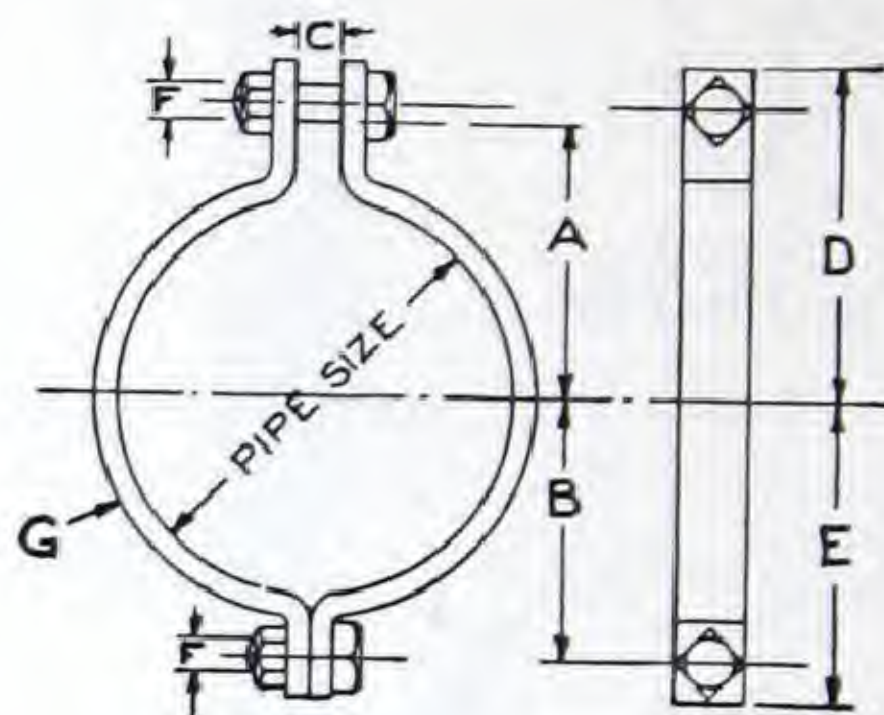
Pipe Size	Price Each	A	B	C	Size of Screw D	Pipe Size	Price Each	A	B	C	Size of Screw D
$\frac{3}{4}$	\$0.05	6	$3\frac{15}{16}$	$\frac{5}{16}$	No. 16	$2\frac{1}{2}$	\$0.11	10	$6\frac{1}{16}$	$\frac{3}{8}$	$\frac{3}{8}$
$\frac{3}{4}$	.05	8	$4\frac{1}{2}$	$\frac{5}{16}$	16	$2\frac{1}{2}$	.11	12	$6\frac{1}{2}$	$\frac{3}{8}$	$\frac{3}{8}$
$\frac{3}{4}$	.06	10	$5\frac{1}{16}$	$\frac{5}{16}$	16	$2\frac{1}{2}$	.12	14	$6\frac{15}{16}$	$\frac{3}{8}$	$\frac{3}{8}$
$\frac{3}{4}$	.06	12	$5\frac{5}{8}$	$\frac{5}{16}$	16	$2\frac{1}{2}$	.13	16	$7\frac{3}{8}$	$\frac{3}{8}$	$\frac{3}{8}$
1	.05	6	$4\frac{3}{16}$	$\frac{5}{16}$	No. 16	3	.11	10	$6\frac{11}{16}$	$\frac{3}{8}$	$\frac{3}{8}$
1	.05	8	$4\frac{3}{4}$	$\frac{5}{16}$	16	3	.11	12	$7\frac{1}{8}$	$\frac{3}{8}$	$\frac{3}{8}$
1	.06	10	$5\frac{5}{16}$	$\frac{5}{16}$	16	3	.12	14	$7\frac{9}{16}$	$\frac{3}{8}$	$\frac{3}{8}$
1	.06	12	$5\frac{7}{8}$	$\frac{5}{16}$	16	3	.13	16	8	$\frac{3}{8}$	$\frac{3}{8}$
$1\frac{1}{4}$	.05	6	$4\frac{1}{2}$	$\frac{5}{16}$	No. 16	$3\frac{1}{2}$	.15	10	$7\frac{3}{16}$	$\frac{7}{16}$	$\frac{1}{2}$
$1\frac{1}{4}$	.05	8	$5\frac{1}{16}$	$\frac{5}{16}$	16	$3\frac{1}{2}$	.15	12	$7\frac{5}{8}$	$\frac{7}{16}$	$\frac{1}{2}$
$1\frac{1}{4}$	.06	10	$5\frac{5}{8}$	$\frac{5}{16}$	16	$3\frac{1}{2}$	.18	14	$8\frac{1}{16}$	$\frac{7}{16}$	$\frac{1}{2}$
$1\frac{1}{4}$	.06	12	$6\frac{3}{16}$	$\frac{5}{16}$	16	$3\frac{1}{2}$	.21	16	$8\frac{1}{2}$	$\frac{7}{16}$	$\frac{1}{2}$
$1\frac{1}{4}$	.07	14	$6\frac{3}{4}$	$\frac{5}{16}$	16						
$1\frac{1}{2}$	.05	6	$4\frac{13}{16}$	$\frac{5}{16}$	No. 16	4	.15	12	$8\frac{1}{8}$	$\frac{7}{16}$	$\frac{1}{2}$
$1\frac{1}{2}$	.05	8	$5\frac{3}{8}$	$\frac{5}{16}$	16	4	.18	14	$8\frac{9}{16}$	$\frac{7}{16}$	$\frac{1}{2}$
$1\frac{1}{2}$	.06	10	$5\frac{15}{16}$	$\frac{5}{16}$	16	5	.21	16	9	$\frac{7}{16}$	$\frac{1}{2}$
$1\frac{1}{2}$	.06	12	$6\frac{1}{2}$	$\frac{5}{16}$	16	5	.28	12	$9\frac{5}{16}$	$\frac{9}{16}$	$\frac{1}{2}$
$1\frac{1}{2}$	.06	12	$6\frac{1}{2}$	$\frac{5}{16}$	16	5	.30	14	$9\frac{3}{4}$	$\frac{9}{16}$	$\frac{1}{2}$
$1\frac{1}{2}$	.07	14	$7\frac{1}{16}$	$\frac{5}{16}$	16	5	.32	16	$10\frac{3}{16}$	$\frac{9}{16}$	$\frac{1}{2}$
2	.05	8	$5\frac{7}{8}$	$\frac{5}{16}$	No. 16	6	.35	12	$10\frac{11}{16}$	$\frac{5}{8}$	$\frac{1}{2}$
2	.06	10	$6\frac{7}{16}$	$\frac{5}{16}$	16	6	.38	14	$11\frac{1}{8}$	$\frac{5}{8}$	$\frac{1}{2}$
2	.06	12	7	$\frac{5}{16}$	16	6	.41	16	$11\frac{9}{16}$	$\frac{5}{8}$	$\frac{1}{2}$
2	.07	14	$7\frac{9}{16}$	$\frac{5}{16}$	16	7	.60	16	$12\frac{3}{4}$	$\frac{3}{4}$	$\frac{5}{8}$
2	.08	16	$8\frac{1}{8}$	$\frac{5}{16}$	16	8	.60	16	$12\frac{3}{4}$	$\frac{3}{4}$	$\frac{5}{8}$

When ordering specify length.
Order by Figure Number.

HANGERS

Grinnell Wrought Pipe Clamps

Wrought Iron

Wrought Pipe Clamp
Fig. No. 212

LIST PRICES AND DIMENSIONS—Fig. No. 212

Pipe Size	Price Each	A	B	C	D	E	F	G
2	\$0.30	$1\frac{15}{16}$	$1\frac{15}{16}$	$\frac{1}{2}$	$2\frac{5}{8}$	$2\frac{7}{16}$	$\frac{3}{8}$	$\frac{1}{4} \times 1$
$2\frac{1}{2}$	.35	$2\frac{7}{16}$	$2\frac{1}{4}$	$\frac{5}{8}$	$3\frac{3}{16}$	$2\frac{13}{16}$	$\frac{7}{16}$	$\frac{1}{4} \times 1$
3	.40	$2\frac{3}{4}$	$2\frac{9}{16}$	$\frac{5}{8}$	$3\frac{1}{2}$	$3\frac{1}{8}$	$\frac{7}{16}$	$\frac{1}{4} \times 1$
$3\frac{1}{2}$	.45	3	$2\frac{15}{16}$	$\frac{5}{8}$	$3\frac{11}{16}$	$3\frac{1}{2}$	$\frac{7}{16}$	$\frac{3}{8} \times 1\frac{1}{4}$
4	.50	$3\frac{3}{8}$	$3\frac{1}{4}$	$\frac{3}{4}$	$4\frac{1}{4}$	$3\frac{7}{8}$	$\frac{1}{2}$	$\frac{3}{8} \times 1\frac{1}{4}$
$4\frac{1}{2}$	.75	$3\frac{5}{8}$	$3\frac{1}{2}$	$\frac{3}{4}$	$4\frac{1}{2}$	$4\frac{1}{8}$	$\frac{1}{2}$	$\frac{3}{8} \times 1\frac{1}{2}$
5	.75	$3\frac{15}{16}$	$3\frac{13}{16}$	$\frac{3}{4}$	$4\frac{13}{16}$	$4\frac{7}{16}$	$\frac{1}{2}$	$\frac{3}{8} \times 1\frac{1}{2}$
6	.75	$4\frac{11}{16}$	$4\frac{7}{16}$	$\frac{7}{8}$	$5\frac{3}{4}$	$5\frac{3}{16}$	$\frac{5}{8}$	$\frac{3}{8} \times 1\frac{1}{2}$
7	1.00	$5\frac{3}{16}$	$5\frac{1}{16}$	$\frac{7}{8}$	$6\frac{1}{4}$	$5\frac{13}{16}$	$\frac{5}{8}$	$\frac{1}{2} \times 1\frac{1}{2}$
8	1.25	6	$5\frac{11}{16}$	1	$7\frac{1}{4}$	$6\frac{9}{16}$	$\frac{3}{4}$	$\frac{1}{2} \times 1\frac{1}{2}$
9	1.60	$6\frac{1}{2}$	$6\frac{3}{16}$	1	$7\frac{3}{4}$	$7\frac{1}{16}$	$\frac{3}{4}$	$\frac{1}{2} \times 2$
10	1.60	$7\frac{1}{16}$	$6\frac{3}{4}$	1	$8\frac{5}{16}$	$7\frac{5}{8}$	$\frac{3}{4}$	$\frac{1}{2} \times 2$
12	2.00	$8\frac{1}{16}$	$7\frac{3}{4}$	1	$9\frac{5}{16}$	$8\frac{5}{8}$	$\frac{3}{4}$	$\frac{1}{2} \times 2$

The Wrought Pipe Clamp shown above is used to a great extent for hanging power piping, etc. It is used with the Special I Beam Clamp shown on opposite page, to make the Special Adjustable I Beam Clamp Hanger shown on that page. This hanger can be used with other beam clamps, flanges, etc. The Wrought Pipe Clamp is also used for anchoring pipe on steam and hot water mains.

Order by Figure Number.

HANGERS

Grinnell Special I Beam Clamps
Wrought Iron

Special I Beam Clamp
Fig. No. 213

A clamp designed for special work on Industrial Piping Systems. Used on either Standard Carnegie or Bethlehem Beams.

This special clamp is made up only on order.

Prices on application. When ordering please state size and kind of I Beam, also the size of iron and the space between halves of clamp.

The illustration at the left shows the I Beam clamp and extension piece. This clamp is however more generally used with eye rod as shown in illustration below. Prices for I Beam clamp will not include Extension Piece.

Special Adjustable I Beam Clamp Hangers

The Adjustable I Beam Clamp Hanger is one of the many special hangers we have developed to meet unusual conditions. This type of hanger is used extensively on industrial Piping and Power Plant work. It is adjustable through the use of turnbuckles which permits an adjustment of from 4 to 6 inches.

The Wrought Pipe Clamp shown on opposite page is used in this hanger. Welded eye rods, machine threaded, are attached to special I Beam Clamp and Wrought Pipe Clamp with bolts and nuts of the clamps.

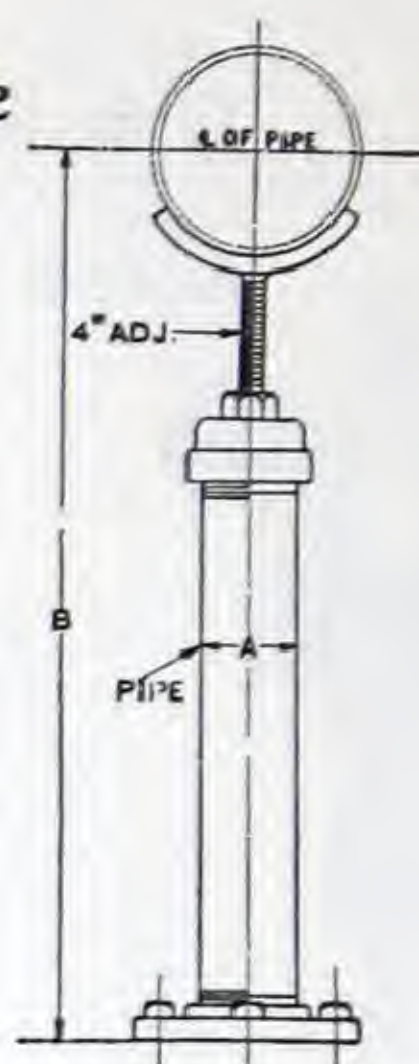
Prices on this special hanger furnished on application. A request for prices or an order should state the size and kind of I Beam and the size of pipe to be supported, distance from bottom of I Beam to center of pipe, also size of Iron for I Beam Clamp and size of rod.

Order by Figure Number.



Special Adjustable I Beam
Clamp Hanger
Fig. No. 214

HANGERS

Grinnell Adjustable
Saddle StandsAdjustable Saddle Stand
Fig. No. 210

LIST PRICES AND DIMENSIONS—Fig. No. 210

Pipe Size	A	Height B	Price Each	Pipe Size	A	Height B	Price Each
2½-3-2½	2½	2' 0"	11.25	7-8	3	2' 0"	\$14.50
		4' 0"	12.50			4' 0"	15.50
	3	5' 6"	15.00		3½	5' 6"	18.75
		7' 0"	16.50			7' 0"	20.00
4-5	2½	2' 0"	11.25	9-10	3	2' 0"	16.50
		4' 0"	12.50			4' 0"	17.50
	3	5' 6"	15.00		3½	5' 6"	20.50
		7' 0"	16.50			7' 0"	22.00
6	2½	2' 0"	13.75	12	3	2' 0"	18.25
		4' 0"	14.50			4' 0"	19.50
	3	5' 6"	16.75		3½	5' 6"	22.50
		7' 0"	17.50			7' 0"	23.75

The Adjustable Saddle Stand is used when it is necessary to support piping at a height of from 18" to 7' above floors. An adjustment of approximately 4" can be obtained with this pipe support by turning nut at top of stand cap. Threaded rod is prevented from swaying by collar attached to lower end of rod, extending inside of pipe stand.

The Adjustable Saddle Stand is made up only upon order, and in the sizes given in table above.

Long runs of pipe should be anchored at intervals to prevent side sway. In all cases the pipe flange at base of stand should be securely fastened to a solid floor or foundation.

For intermediate lengths use next higher price.

If there is any appreciable amount of expansion and contraction in the pipe line, we can furnish this pipe stand with single roll in place of saddle. Prices on application.

Order by Figure Number.

HANGERS

**Grinnell Special Pipe Pole Supports
for Outside Lines**

The Special Pipe Pole Support for Outside Lines was designed a number of years ago to provide an adjustable type of permanent support for piping between buildings and it has proven to be very satisfactory.

This support can be used for high and low pressure steam lines as well as for all kinds of process piping, either with or without pipe covering. Concrete footing is to be furnished by the customer.

Prices for this support will be furnished on application, and the application should state the size of pipe to be supported as well as the height above the ground.

Special Pipe Pole Support
for Outside Lines
Fig. No. 211

HANGERS
U. S. Expansion Cases

Malleable Iron



U. S. Expansion Case
Closed Back Type
Fig. No. 117



U. S. Expansion Case
Open Back 4-Way Expansion Type
Fig. No. 118

LIST PRICES—Fig. No. 117

Size	Price per 100	Pipe Size Inches	Length of Expansion Case	Drill Size	Units per Box
1/4	\$15.00	.....	1 1/2	5/8	100
5/16	18.00	.....	1 3/4	5/8	100
3/8	25.00	3/4 - 2	2 1/8	3/4	100
7/16	32.00	.....	2 1/2	7/8	100
1/2	38.00	2 1/2 - 3 1/2	2 3/4	1	100
9/16	45.00	.....	3 1/4	1 1/8	50
5/8	45.00	4 - 5	3 1/4	1 1/8	50
3/4	65.00	6 - 7	3 3/4	1 3/8	50
7/8	95.00	8 - 12	4 1/4	1 1/2	25
1	110.00	14 - 16	4 3/4	1 5/8	25

LIST PRICES—Fig. No. 118

Size	Price per 100	Length of Expansion Case	Drill Size	Units per Box
3/16	\$15.00	7/8	7/16	100
1/4	15.00	1 1/4	1/2	100
5/16	18.00	1 1/2	9/16	100
3/8	25.00	1 3/4	5/8	100
1/2	38.00	2 1/4	7/8	100
5/8	45.00	2 3/4	1	50
3/4	65.00	3 1/4	1 1/4	50

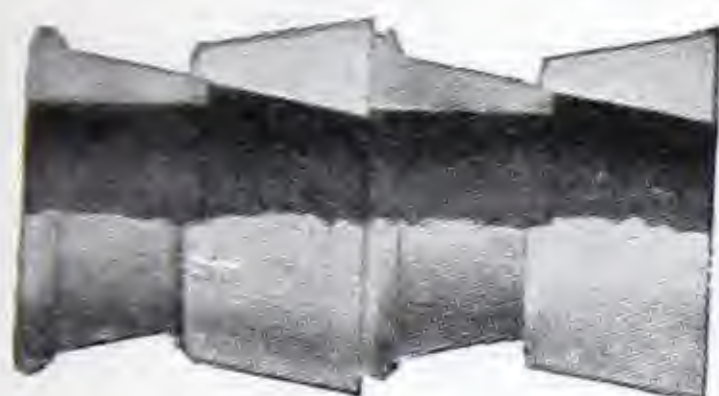
"Size" denotes diameter of bolt or rod with which expansion case can be used.
U. S. 4-way open back expansion cases can be furnished in brass in the following sizes,
3/16, 1/4, 5/16, 3/8, 1/2 inches. Prices on application.
Order by Figure Number.

HANGERS

Cinch Expansion Cases

(Patented)

Lead Alloy and Iron—Threaded or Plain



Cinch Expansion Case
Two Unit Anchorage
One Unit Threaded—Fig. No. 242
Both Units Plain—Fig. No. 243



Cinch Expansion Case
Three Unit Anchorage
One Unit Threaded—Fig. No. 244
All Units Plain—Fig. No. 245

LIST PRICES—Fig. Nos. 242, 243

Size	Price per 100 Sets 2 Irons—2 Leads	Minimum Depth of Hole	Diameter of Hole and Drill Required
$\frac{3}{16}$	\$15.00	$\frac{7}{8}$	$\frac{1}{2}$
$\frac{1}{4}$	17.00	$1\frac{1}{8}$	$\frac{5}{8}$
$\frac{5}{16}$	18.00	$1\frac{1}{8}$	$\frac{5}{8}$
$\frac{3}{8}$	25.00	$1\frac{1}{2}$	$\frac{3}{4}$
$\frac{7}{16}$	30.00	$1\frac{1}{2}$	$\frac{3}{4}$
$\frac{1}{2}$	38.00	$1\frac{3}{4}$	1
$\frac{5}{8}$	50.00	$1\frac{7}{8}$	$1\frac{1}{8}$
$\frac{3}{4}$	70.00	$2\frac{1}{2}$	$1\frac{3}{8}$
$\frac{7}{8}$	95.00	$2\frac{3}{4}$	$1\frac{1}{2}$
1	125.00	$3\frac{1}{4}$	$1\frac{5}{8}$
$1\frac{1}{8}$	280.00	$4\frac{1}{2}$	2
$1\frac{1}{4}$	300.00	$4\frac{3}{4}$	$2\frac{1}{8}$
$1\frac{1}{2}$	450.00	$5\frac{1}{4}$	$2\frac{3}{8}$

LIST PRICES—Fig. Nos. 244, 245

Size	Price per 100 Sets 3 Irons—3 Leads	Minimum Depth of Hole	Diameter of Hole and Drill Required
$\frac{3}{16}$	\$22.50	$1\frac{1}{8}$	$\frac{1}{2}$
$\frac{1}{4}$	25.50	$1\frac{5}{8}$	$\frac{5}{8}$
$\frac{5}{16}$	27.00	$1\frac{5}{8}$	$\frac{5}{8}$
$\frac{3}{8}$	37.50	$2\frac{1}{4}$	$\frac{3}{4}$
$\frac{7}{16}$	45.00	$2\frac{1}{4}$	$\frac{3}{4}$
$\frac{1}{2}$	57.00	$2\frac{5}{8}$	1
$\frac{5}{8}$	75.00	$2\frac{7}{8}$	$1\frac{1}{8}$
$\frac{3}{4}$	105.00	$3\frac{3}{4}$	$1\frac{3}{8}$
$\frac{7}{8}$	142.50	4	$1\frac{1}{2}$
1	187.50	$4\frac{7}{8}$	$1\frac{5}{8}$
$1\frac{1}{8}$	420.00	6	2
$1\frac{1}{4}$	450.00	$6\frac{1}{4}$	$2\frac{1}{8}$
$1\frac{1}{2}$	675.00	$7\frac{1}{4}$	$2\frac{3}{8}$

"Size" denotes diameter of Bolt with which expansion Case is to be used.
Order by Figure Number.

HANGERS

U. S. Expansion Cases



U. S. Expansion Case, Screw Anchor Type
(Lead Alloy)
Fig. No. 122



U. S. Expansion Case, Coach Screw Type
(Malleable Iron)

Fig. No. 121

LIST PRICES—Fig. No. 121. (Expansion Case Only)

Size Diameter of Coach Screw	Price Per 100	Length Long Case	Length Short Case	Length Ex-Short Case	Drill Size	Units Per Box
$\frac{5}{16}$	\$15.00	1	...	...	$\frac{7}{16}$	100
$\frac{1}{4}$	15.00	$1\frac{1}{2}$	1	...	$\frac{1}{2}$	100
$\frac{5}{16}$	18.00	$1\frac{3}{4}$	1	...	$\frac{9}{16}$	100
$\frac{3}{8}$	25.00	$2\frac{3}{4}$	2	$1\frac{1}{2}$	$\frac{5}{8}$	100
$\frac{7}{16}$	32.00	$2\frac{3}{4}$	2	...	$\frac{11}{16}$	100
$\frac{1}{2}$	38.00	$3\frac{1}{2}$	2	$1\frac{1}{2}$	$\frac{3}{4}$	100
$\frac{5}{8}$	45.00	$3\frac{1}{2}$	2	...	$\frac{7}{8}$	50
$\frac{3}{4}$	65.00	$3\frac{1}{2}$	2	...	$1\frac{1}{8}$	50
$\frac{7}{8}$	95.00	$4\frac{1}{2}$	...	...	$1\frac{3}{8}$	25
1	110.00	5	...	...	$1\frac{5}{8}$	25

LIST PRICES—Fig. No. 122. (Anchor Only)

Size Inside Diameter and Length	Price Per 100	Drill Size	Units Per Box	Screw Size
$\frac{1}{8}$ x $\frac{1}{2}$	\$4.40	$\frac{1}{4}$	100	5- 6- 7- 8
$\frac{1}{8}$ x $\frac{3}{4}$	4.40	$\frac{1}{4}$	100	5- 6- 7- 8
$\frac{5}{16}$ x $\frac{3}{4}$	5.00	$\frac{5}{16}$	100	9-10-11-12
$\frac{5}{16}$ x 1 Light	5.00	$\frac{5}{16}$	100	9-10-11-12
$\frac{5}{16}$ x 1 Heavy	5.00	$\frac{3}{8}$	100	9-10-11-12
$\frac{5}{16}$ x $1\frac{5}{8}$	6.25	$\frac{5}{16}$	100	9-10-11-12
$\frac{1}{4}$ x $\frac{3}{4}$	5.60	$\frac{7}{16}$	100	14
$\frac{1}{4}$ x 1	5.60	$\frac{7}{16}$	100	14
$\frac{1}{4}$ x $1\frac{1}{2}$	8.00	$\frac{7}{16}$	100	14
$\frac{1}{4}$ x 2	10.00	$\frac{7}{16}$	100	14
$\frac{5}{16}$ x 1	6.25	$\frac{7}{16}$	100	16-18
$\frac{5}{16}$ x $1\frac{1}{2}$	10.00	$\frac{7}{16}$	100	16-18
$\frac{5}{16}$ x 2	13.00	$\frac{7}{16}$	100	16-18
$\frac{3}{8}$ x 2	15.00	$\frac{9}{16}$	100	20-24

Above prices are for Expansion Cases in both types only.
For list prices on coach screws and wood screws see pages 480 and 481.
Order by Figure Number.

HANGERS

Steel Toggle BoltsSteel Toggle Bolt
Fig. No. 123-ASteel Toggle Bolt
Fig. No. 123-BSteel Toggle Bolt
Fig. No. 124

LIST PRICES

Fig. Nos. 123-A, 123-B				Fig. No. 124			
Diameter and Length of Screw	Price Per 100	Drill Size	Units Per Box	Diameter and Length of Screw	Price Per 100	Drill Size	Units Per Box
$\frac{1}{8}$ x 3	\$9.00	..	50	$\frac{3}{16}$ x 3	\$9.50	$\frac{3}{8}$	50
$\frac{1}{8}$ x 4	10.00	..	50	4	10.50	$\frac{3}{8}$	50
$\frac{3}{16}$ x 3	9.50	$\frac{1}{2}$	50	5	12.00	$\frac{3}{8}$	50
4	10.50	$\frac{1}{2}$	50	6	12.50	$\frac{3}{8}$	50
5	12.00	$\frac{1}{2}$	50	$\frac{1}{4}$ x 3	10.50	$\frac{1}{2}$	50
6	12.50	$\frac{1}{2}$	50	4	11.75	$\frac{1}{2}$	50
$\frac{1}{4}$ x 3	10.50	$\frac{5}{8}$	50	5	13.00	$\frac{1}{2}$	50
4	11.75	$\frac{5}{8}$	50	6	14.00	$\frac{1}{2}$	50
5	13.00	$\frac{5}{8}$	50	$\frac{5}{16}$ x 3	17.50	$\frac{1}{2}$	50
6	14.00	$\frac{5}{8}$	50	4	18.00	$\frac{1}{2}$	50
.....	.....	..	..	6	20.00	$\frac{1}{2}$	50
.....	.....	..	..	$\frac{3}{8}$ x 3	20.00	$\frac{5}{8}$	50
.....	.....	..	..	4	24.00	$\frac{5}{8}$	50
.....	.....	..	..	6	31.00	$\frac{5}{8}$	50
.....	.....	..	..	$\frac{1}{2}$ x 3	30.00	$\frac{3}{4}$	50
.....	.....	..	..	4	32.00	$\frac{3}{4}$	50
.....	.....	..	..	6	36.00	$\frac{3}{4}$	50

These Toggle Bolts are strongly made and are used for fastening fixtures to hollow tile and all types of hollow walls and ceilings.

Figure Nos. 123-A and 123-B are for light work.

Figure No. 124 with swivel bolt and nut is used mainly for holding the heavier type of fixtures.

Figure Nos. 123-A and 123-B can be furnished with brass screws and Figure No. 124 with brass bolts and brass or nickel plated Bonnet Nuts. List prices and discounts furnished upon application.

Order by Figure Number.

HANGERS

*Grinnell One Hole Clamps**Malleable Iron*

One Hole Clamp
Fig. No. 126

LIST PRICES

Conduit or Pipe Size Nominal Inside Diameter	Cable Size or Outside Diameter of Conduit Inches	Price Per 100	Diameter of Screw Hole	Size Expansion Case or Screw Anchor
$\frac{3}{8}$	.67	\$4.80	$\frac{3}{16}$	$\frac{3}{16} \times 1$
$\frac{1}{2}$	.84	6.00	$\frac{1}{4}$	$\frac{3}{16} \times 1$
$\frac{3}{4}$	1.05	7.20	$\frac{5}{16}$	$\frac{1}{4} \times 1\frac{1}{2}$
1	1.31	9.60	$\frac{5}{16}$	$\frac{1}{4} \times 1\frac{1}{2}$
$1\frac{1}{4}$	1.66	16.80	$\frac{3}{8}$	$\frac{1}{4} \times 1\frac{1}{2}$
$1\frac{1}{2}$	1.90	24.00	$\frac{7}{16}$	$\frac{3}{8} \times 2$
2	2.37	48.00	$\frac{9}{16}$	$\frac{1}{2} \times 2$
$2\frac{1}{2}$	2.87	72.00	$\frac{5}{8}$	$\frac{1}{2} \times 2$
3	3.50	96.00	$\frac{5}{8}$	$\frac{1}{2} \times 3\frac{1}{2}$
$3\frac{1}{2}$	4.00	144.00	$\frac{11}{16}$	$\frac{5}{8} \times 3\frac{1}{2}$
4	4.50	156.00	$\frac{11}{16}$	$\frac{5}{8} \times 3\frac{1}{2}$

This clamp is designed for supporting all standard conduit cable or wrought iron or steel pipe in sizes $\frac{3}{8}$ " to 4". It is neat in appearance and requires only one screw or bolt.

Furnished in either baked black japanned or galvanized finish.

When ordering specify inside diameter of conduit or pipe, or outside diameter of lead cable with which the clamp is to be used.

Order by Figure Number.

HANGERS

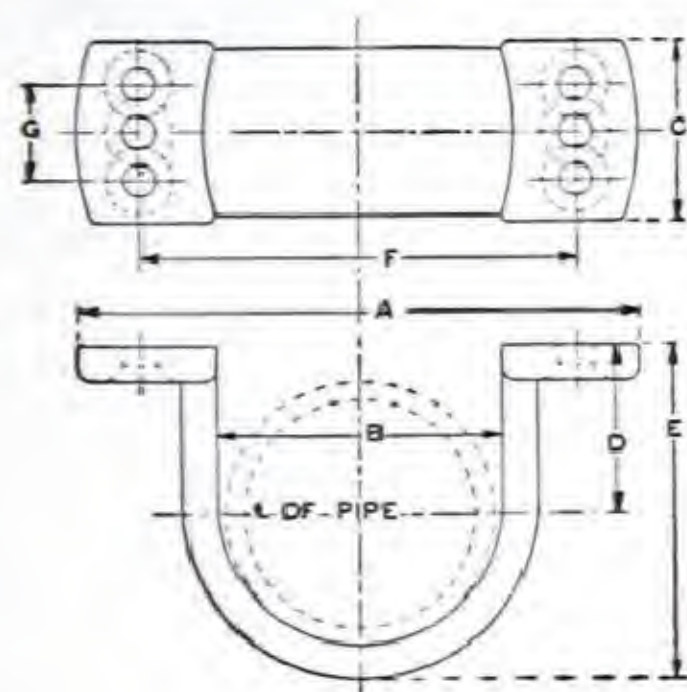
Grinnell Short Clips—Long Clips
Cast Iron



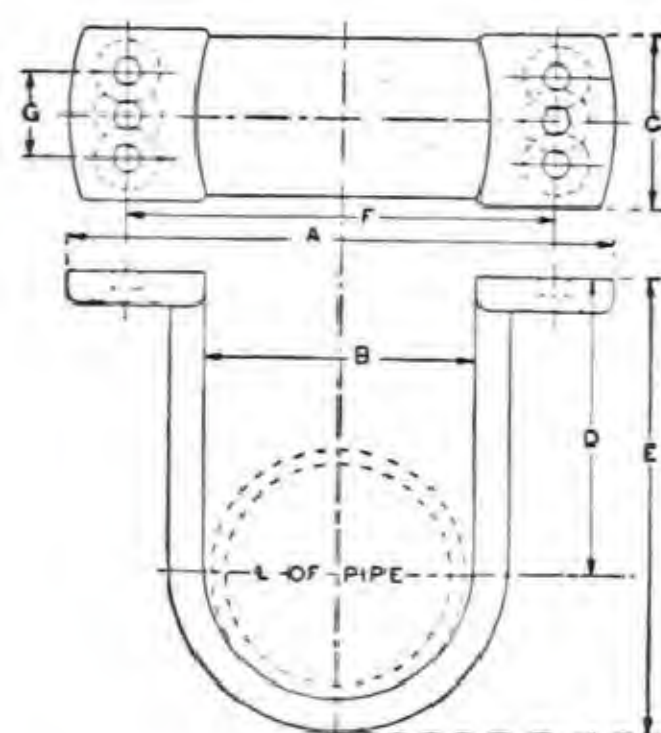
Short Clip
Fig. No. 206



Long Clip
Fig. No. 207



Short Clip



Long Clip

LIST PRICES—Fig. No. 206

Pipe Size	Price Each	A	B	C	D	E	F	G	Size Screws
$\frac{3}{4}$	\$0.15	$3\frac{5}{16}$	$1\frac{1}{4}$	$1\frac{1}{8}$	$2\frac{3}{16}$	$1\frac{9}{16}$	$2\frac{7}{16}$	...	No. 14 x $1\frac{1}{2}$
1	.16	$3\frac{9}{16}$	$1\frac{3}{8}$	$1\frac{1}{4}$	$2\frac{7}{16}$	$1\frac{3}{4}$	$2\frac{3}{4}$	...	No. 14 x $1\frac{1}{2}$
$1\frac{1}{4}$	.18	$4\frac{3}{8}$	$1\frac{13}{16}$	$1\frac{5}{8}$	$1\frac{3}{2}$	$2\frac{3}{8}$	$3\frac{1}{4}$	...	No. 14 x $1\frac{1}{2}$
$1\frac{1}{2}$	.20	$4\frac{3}{8}$	$2\frac{1}{16}$	$1\frac{3}{8}$	$1\frac{5}{8}$	$2\frac{1}{2}$	$3\frac{7}{16}$	...	No. 18 x $1\frac{1}{2}$
2	.25	5	$2\frac{1}{2}$	$1\frac{5}{8}$	$1\frac{7}{8}$	$2\frac{5}{8}$	4	...	No. 18 x $1\frac{1}{2}$
$2\frac{1}{2}$	.30	$6\frac{1}{8}$	$3\frac{1}{8}$	$2\frac{1}{8}$	$1\frac{7}{8}$	$3\frac{5}{8}$	$4\frac{13}{16}$	1	No. 18 x $1\frac{1}{2}$
3	.40	$6\frac{11}{16}$	$3\frac{5}{8}$	$2\frac{1}{8}$	2	$4\frac{1}{8}$	$5\frac{1}{4}$	1	No. 18 x $1\frac{1}{2}$
$3\frac{1}{2}$	.50	$7\frac{1}{4}$	$4\frac{1}{8}$	$2\frac{5}{16}$	$2\frac{3}{16}$	$4\frac{9}{16}$	6	$1\frac{1}{8}$	No. 18 x $1\frac{1}{2}$
4	.65	$8\frac{3}{16}$	$4\frac{3}{8}$	$2\frac{1}{4}$	$2\frac{9}{16}$	$5\frac{1}{4}$	$6\frac{3}{4}$	$1\frac{1}{8}$	No. 18 x $1\frac{1}{2}$

LIST PRICES—Fig. No. 207

Pipe Size	Price Each	A	B	C	D	E	F	G	Size Screws
$\frac{3}{4}$	\$0.17	$3\frac{1}{4}$	$1\frac{3}{16}$	$1\frac{1}{8}$	$2\frac{1}{2}$	$2\frac{13}{16}$	$2\frac{3}{8}$	...	No. 14 x $1\frac{1}{2}$
1	.18	$3\frac{9}{16}$	$1\frac{3}{8}$	$1\frac{1}{4}$	$2\frac{3}{2}$	$3\frac{1}{16}$	$2\frac{3}{4}$	...	No. 14 x $1\frac{1}{2}$
$1\frac{1}{4}$	.20	$4\frac{1}{16}$	$1\frac{13}{16}$	$1\frac{5}{8}$	$2\frac{9}{2}$	$3\frac{3}{8}$	$3\frac{1}{4}$	...	No. 14 x $1\frac{1}{2}$
$1\frac{1}{2}$	.22	$4\frac{1}{2}$	$2\frac{1}{16}$	$1\frac{3}{8}$	$2\frac{1}{2}$	$3\frac{11}{16}$	$3\frac{9}{16}$	...	No. 18 x $1\frac{1}{2}$
2	.27	$5\frac{1}{8}$	$2\frac{1}{2}$	$1\frac{5}{8}$	$2\frac{13}{16}$	$4\frac{5}{16}$	$4\frac{1}{8}$	...	No. 18 x $1\frac{1}{2}$
$2\frac{1}{2}$	.35	$5\frac{15}{16}$	$3\frac{3}{2}$	2	$2\frac{3}{4}$	$4\frac{1}{2}$	$4\frac{5}{8}$	1	No. 18 x $1\frac{1}{2}$
3	.45	$6\frac{5}{8}$	$3\frac{11}{16}$	$2\frac{1}{8}$	$2\frac{7}{8}$	5	$5\frac{1}{4}$	1	No. 18 x $1\frac{1}{2}$
$3\frac{1}{2}$	.60	$7\frac{1}{2}$	$4\frac{1}{8}$	$2\frac{3}{8}$	$3\frac{1}{8}$	$5\frac{1}{2}$	$6\frac{1}{8}$	$1\frac{3}{16}$	No. 18 x $1\frac{1}{2}$
4	.75	$7\frac{15}{16}$	$4\frac{1}{2}$	$2\frac{7}{16}$	$3\frac{3}{8}$	$6\frac{1}{16}$	$6\frac{1}{2}$	$1\frac{1}{4}$	No. 18 x $1\frac{1}{2}$

Note: Clips for pipe larger than 2", use 4 screws.
Order by Figure Number.

HANGERS

Grinnell Tin Clips—Pear Shape Rings
Cast Iron Building Washers



Tin Clips
Fig. No. 231



Pear Shape Rings—Malleable
Fig. No. 232

LIST PRICES—Fig. No. 231

Size	Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$
Price	Each	.02	.02	.02	.03
Size	Inches	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Price.....	Each	.04	.05	.06	.08

LIST PRICES—Fig. No. 232

Size	Inches	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$
Price	Each	.10	.13	.15	.18	.20	.23
Size	Inches	3	$3\frac{1}{2}$	4	5	6	...
Price.....	Each	.25	.40	.50	.60	.75	...



Cast Iron Building Washers
Fig. No. 233

LIST PRICES—Fig. No. 233

Size.....	Inches	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{1}{2}$
Price.....	Each	.15	.15	.20	.35	.45	.65	.80	1.25
Thickness.....	Inches	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{3}{8}$
Outside Diameter.....	Inches	$2\frac{1}{2}$	$2\frac{3}{4}$	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	6

Order by Figure Number.

HANGERS

Solid Ring and Expansion Pipe Hangers
Cast Iron



Expansion Pipe Hanger
Fig. No. 234



Solid Ring Hanger
Short—Fig. No. 235



Solid Ring Hanger
Long—Fig. No. 236

LIST PRICES—Fig. No. 234

Pipe Size Inches	Price Each Without Pipe	Tapped for Pipe Size Inches	Pipe Size Inches	Price Each Without Pipe	Tapped for Pipe Sizes Inches
$\frac{1}{2}$	\$0.17	$\frac{1}{4}$	$3\frac{1}{2}$	\$0.55	$\frac{1}{2}$
$\frac{3}{4}$	.17	$\frac{3}{8}$	4	.63	$\frac{1}{2}$
1	.18	$\frac{3}{8}$	$4\frac{1}{2}$	.90	$\frac{1}{2}$
$1\frac{1}{4}$	.19	$\frac{3}{8}$	5	1.12	$\frac{3}{4}$
$1\frac{1}{2}$	.25	$\frac{3}{8}$	6	1.35	$\frac{3}{4}$
2	.29	$\frac{3}{8}$	7	1.80	$\frac{3}{4}$
$2\frac{1}{2}$	.36	$\frac{1}{2}$	8	2.25	$\frac{3}{4}$
3	.44	$\frac{1}{2}$	.....	.....	.....

LIST PRICES—Fig. Nos. 235, 236

Pipe Size Inches	Price Per 100 Pcs. Fig. No. 235		Length to Center of Ring	Pipe Size Inches	Price Per 100 Pcs. Fig. No. 236		Length to Center of Ring
	Black	Galv.			Black	Galv.	
$\frac{3}{8}$	\$5.00	\$6.50	1	$\frac{3}{8}$	\$6.50	\$8.00	$2\frac{3}{8}$
$\frac{1}{2}$	5.00	6.50	$1\frac{1}{8}$	$\frac{1}{2}$	6.50	8.00	$2\frac{1}{2}$
$\frac{3}{4}$	5.80	7.00	$1\frac{1}{4}$	$\frac{3}{4}$	8.00	10.00	$2\frac{3}{4}$
1	7.75	9.00	$1\frac{3}{8}$	1	10.00	12.00	$2\frac{7}{8}$
$1\frac{1}{4}$	10.00	12.00	$1\frac{11}{16}$	$1\frac{1}{4}$	12.00	14.00	$3\frac{1}{4}$
$1\frac{1}{2}$	14.00	16.00	$1\frac{15}{16}$	$1\frac{1}{2}$	15.00	18.00	$3\frac{7}{8}$
2	22.00	25.00	$2\frac{1}{4}$	2	24.00	27.00	$4\frac{1}{2}$

Expansion Pipe Hangers, Fig. No. 234 are furnished without pipe.
Order by Figure Number.

HANGERS

Steel Pipe Hangers



Steel Band Hanger
Fig. No. 237



Hinged Steel
Band Hanger
Fig. No. 238



Extension Bar
Fig. No. 239



Flattened
Lag Screw
Fig. No. 240



Steel Hook
Plate
Fig. No. 241

LIST PRICES—Fig. Nos. 237, 238

Pipe Size, Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$
Fig. No. 237. Each	\$0.14	.14	.16	.18	.20	.22	.24	.26	.30
Fig. No. 238. Each	\$0.17	.17	.19	.21	.23	.25	.27	.29	.33

Pipe Size, Inches	4	$4\frac{1}{2}$	5	6	7	8	9	10	12
Fig. No. 237. Each	\$0.32	.34	.36	.40	.63	.88	1.13	1.38	1.88
Fig. No. 238. Each	\$0.35	.37	.39	.43	.68	.93	1.15	1.45	1.95

LIST PRICES—Fig. Nos. 239, 240

Size.....	Number	1	2	3	4	5
Pipe Size.....Inches		$\frac{1}{2}$ – $1\frac{1}{2}$	2–3	$3\frac{1}{2}$ –6	7–8	9–12
Price, Fig. No. 239...Per Foot		\$0.08	.09	.12	.20	.28
Price, Fig. No. 240.....Each		\$0.10	.12	.14	.20	.25

LIST PRICES—Fig. No. 241

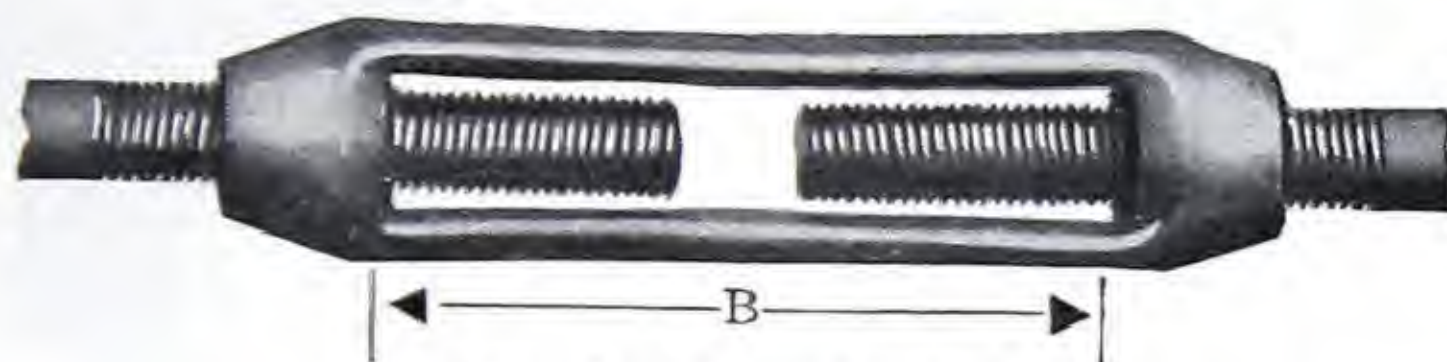
Pipe Size.....Inches	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Price.....per Strip	\$2.50	3.25	3.75	4.25
No. of Hooks.....per Strip	30	30	25	20

Extension Bars, Fig. No. 239, are furnished in 10-ft. lengths. Can easily be cut to any desired length.

Steel Hook Plates, Fig. No. 241, are furnished in strips with number of hooks listed in table above. As many hooks as desired can easily be cut off at ribs shown.

Order by Figure Number.

HANGERS

*Drop Forged Turn-buckles**With Right and Left U. S. Standard Threads*Turn-buckle with Stubs
Fig. No. 230

LIST PRICES WITH OR WITHOUT STUBS

(Standard List of Dec. 15, 1924)

Diam. of Screw Inches	DIMENSION "B" INCHES					
	†6	9	12	15	18	24
$\frac{3}{8}$	.45	.68	.....	.....	.....	.....
$\frac{1}{2}$	.50	.75	.88	1.00	1.25	.....
$\frac{5}{8}$	.60	.90	1.05	1.20	1.50	2.10
$\frac{3}{4}$	.75	1.13	1.31	1.50	1.88	2.63
$\frac{7}{8}$	.90	1.35	1.58	1.80	2.25	3.15
1	1.10	1.65	1.93	2.20	2.75	3.85
$1\frac{1}{8}$	1.40	2.10	2.45	2.80	3.50	4.90
$1\frac{1}{4}$	1.70	2.55	2.98	3.40	4.25	5.95
$1\frac{3}{8}$	2.10	3.15	3.68	4.20	5.25	7.35
$1\frac{1}{2}$	2.50	3.75	4.38	5.00	6.25	8.75
$1\frac{5}{8}$	3.25	4.88	5.69	6.50	8.13	11.38
$1\frac{3}{4}$	4.00	6.00	7.00	8.00	10.00	14.00
$1\frac{7}{8}$	5.00	7.50	8.75	10.00	12.50	17.50
2	6.25	9.38	10.93	12.50	15.63	21.88
$2\frac{1}{4}$	9.25	13.88	16.18	18.50	23.13	32.38
$2\frac{1}{2}$	13.00	19.50	22.75	26.00	32.50	45.50

†Standard length Turn-buckles have 6-inch opening B. This length will be shipped unless otherwise specified.

Turn-buckles complete with stub ends will be furnished unless definitely specified "Without Stub Ends."

Prices for longer lengths and larger sizes, also for Galvanized Turn-buckles furnished on request.

Order by Figure Number.

HANGERS

Grinnell Spring Ceiling Plates

Steel



Spring Ceiling Plate
Fig. No. 133



Illustration A
Spring Ceiling Plate on Rod



Illustration B
Spring Ceiling Plate
in Cross Section



Illustration C
Spring Ceiling Plate on Rod
with Expansion Case

LIST PRICES

Size, Diam. Rod	Price Each	Outside Diam.	Depth
$\frac{3}{8}$	\$0.09	$1\frac{13}{16}$	$\frac{9}{16}$
$\frac{1}{2}$	.145	$2\frac{3}{16}$	$\frac{5}{8}$
$\frac{5}{8}$	.20	$2\frac{1}{2}$	$\frac{11}{16}$
$\frac{3}{4}$	.27	$2\frac{1}{2}$	$\frac{11}{16}$

The Spring Ceiling Plate is unique inasmuch as plate is so held to the rod by five steel points that it can easily be pushed up against the ceiling, but cannot be pulled downward. Illustration B shows a cross sectional view of the Spring Ceiling Plate and shows how points hold against rod.

Once plate is installed in place against ceiling, it will never work loose. Eliminates entirely the need of set screws for fastening ceiling plate to hanger rod.

Spring and plate are stamped from sheet steel and are strongly made.

Where Ceiling Plates are required for $\frac{7}{8}$ " and 1" rods, use Cast Iron Ceiling Plates (Figures No. 215) shown on opposite page.

Order by Figure Number.

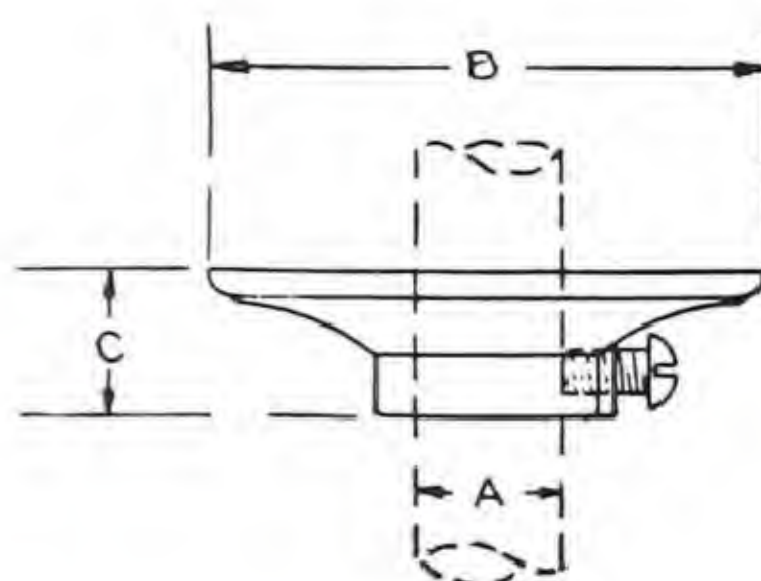
HANGERS

Grinnell Rod Ceiling Plates

Cast Iron



Rod Ceiling Plate
Fig. No. 215



LIST PRICES

SIZE A		Price Each	B	C
Rod	Pipe			
$\frac{3}{8}$	.....	\$0.06	$1\frac{7}{8}$	$\frac{5}{8}$
$\frac{1}{2}$	.....	.08	$2\frac{1}{8}$	$\frac{5}{8}$
$\frac{5}{8}$	.....	.09	$2\frac{3}{8}$	$\frac{5}{8}$
$\frac{3}{4}$	.....	.10	$2\frac{1}{2}$	$\frac{5}{8}$
$\frac{7}{8}$	$\frac{1}{2}$	.11	$2\frac{7}{8}$	$\frac{3}{4}$
1	$\frac{3}{4}$	.13	$3\frac{3}{8}$	1

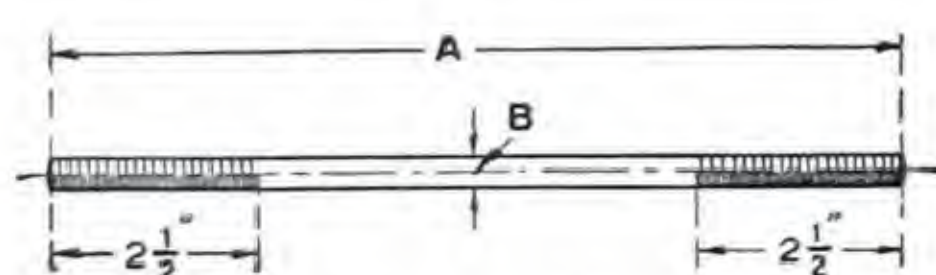
Grinnell Cast Iron Ceiling Plates can be used on coach screw rods installed in plastered, wood, plaster board or metal sheathed ceilings.

This Ceiling Plate can also be used on hanger rods in connection with expansion cases and with inserts.

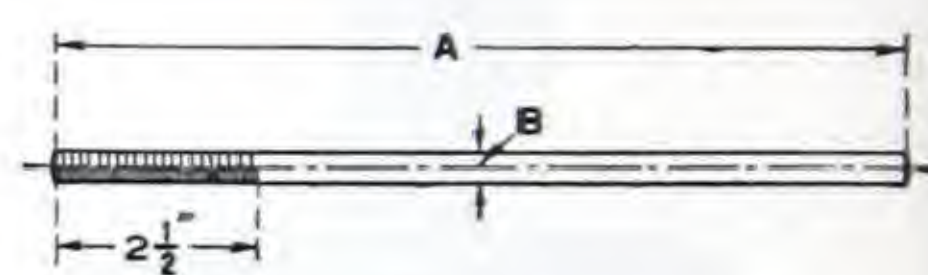
This Ceiling Plate is made of cast iron in a neat design and, in addition to covering up the roughness of the hole made in the ceiling, gives a finished appearance to the work. The tightening of the set screw will hold the Plate in proper position against the ceiling. Although we carry in stock the Cast Iron Ceiling Plate we believe that the Grinnell Spring Ceiling Plate (Fig. No. 133) shown on opposite page is preferable and more adaptable for general use.

Order by Figure Number.

HANGERS

Grinnell Hanger Rods—Machine Threaded

Machine Threaded Both Ends
Fig. No. 140



Machine Threaded One End
Fig. No. 141

LIST PRICES—Fig. Nos. 140, 141

Length A	SIZE B						
	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{8}$
8''	\$0.08	\$0.10	\$0.18	\$0.25	\$0.30	\$0.35	\$0.45
10''	.08	.10	.18	.25	.30	.35	.45
12''	.08	.10	.18	.25	.30	.35	.45
14''	.10	.14	.24	.30	.40	.50	.65
18''	.10	.14	.24	.30	.40	.50	.65
24''	.12	.17	.30	.38	.50	.60	.75
30''	.14	.20	.36	.45	.60	.75	.95
36''	.16	.23	.42	.50	.70	.90	1.10
42''	.18	.26	.48	.60	.80	1.00	1.30
48''	.20	.29	.54	.65	.90	1.15	1.50
54''	.22	.32	.60	.75	1.00	1.25	1.60
60''	.24	.35	.66	.80	1.10	1.35	1.75
66''	.26	.38	.72	.90	1.20	1.50	1.90
72''	.28	.41	.78	.95	1.30	1.60	2.10

Hanger Rods with machine thread $2\frac{1}{2}$ '' long on one or both ends are stocked in sizes and lengths listed in table. Should special lengths be desired, they will be furnished at price for next length above length ordered. For instance, 21'' takes the same price as 24''.

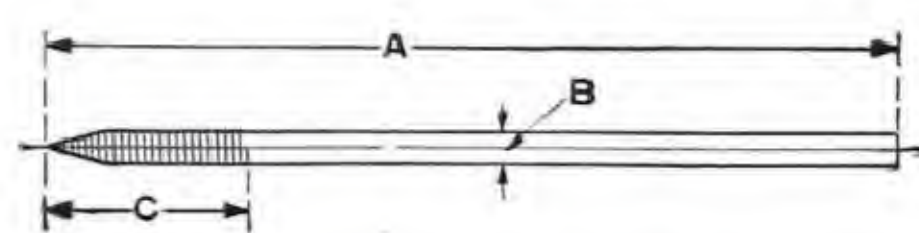
When Hanger Rods are ordered with threads longer than $2\frac{1}{2}$ '', an additional charge will be made.

Order by Figure Number.

HANGERS

Grinnell Coach Screw Rods

Coach Screw Rod
Machine Threaded on Opposite End
Fig. No. 142



Coach Screw Rod
Opposite End Not Threaded
Fig. No. 143

LIST PRICES—Fig. Nos. 142, 143

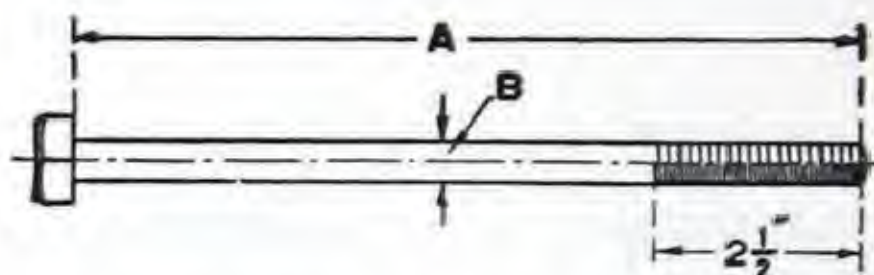
Length A	SIZE B				
	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$
8 inches	\$0.06	\$0.09	\$0.13	\$0.14	\$0.20
10 inches	.06	.09	.13	.14	.20
12 inches	.06	.09	.13	.14	.20
14 inches	.08	.12	.17	.19	.27
18 inches	.08	.12	.17	.19	.27
24 inches	.10	.15	.21	.24	.34
30 inches	.12	.18	.25	.29	.41
36 inches	.14	.21	.29	.34	.48
42 inches	.16	.24	.33	.39	.55
48 inches	.18	.27	.37	.44	.62
54 inches	.20	.30	.41	.49	.69
60 inches	.22	.33	.45	.54	.76
66 inches	.24	.36	.49	.59	.83
72 inches	.26	.39	.53	.64	.90
Dimension C.....	2"	$2\frac{7}{16}$ "	$2\frac{9}{16}$ "	$2\frac{9}{16}$ "	...

Coach Screw Rods with or without machine thread $2\frac{1}{2}$ " long on opposite end are stocked in sizes and lengths listed in table. In addition, $\frac{3}{8}$ " rods Fig. No. 142 are stocked in lengths $9\frac{3}{8}$, $10\frac{1}{8}$, $10\frac{1}{2}$, $10\frac{3}{4}$ and $11\frac{1}{2}$ inches which are used in the Adjustable Coach Screw Clip, Fig. No. 100, shown on page 392. Should lengths not listed be desired, they will be furnished at price for next longer length listed.

When Coach Screw Rods are ordered with machine thread longer than $2\frac{1}{2}$ ", an additional charge will be made.

Order by Figure Number.

HANGERS

Grinnell Square Head Hanger Rods

Square Head Hanger Rod
Threaded—Fig. No. 144
Not Threaded—Fig. No. 145

LIST PRICES—Fig. Nos. 144, 145

Length A	SIZE B				
	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$
8 inches	\$0.05	\$0.07	\$0.10	\$0.15	\$0.26
10 inches	.05	.08	.12	.17	.32
12 inches	.06	.10	.14	.19	.36
14 inches	.06	.11	.15	.22	.40
18 inches	.07	.13	.19	.27	.50
24 inches	.09	.17	.24	.34	.66
30 inches	.10	.21	.29	.42	.80
36 inches	.12	.25	.35	.49	.95
42 inches	.13	.28	.40	.57	1.10
48 inches	.15	.32	.45	.63	1.25
54 inches	.16	.35	.50	.70	1.40
60 inches	.18	.40	.55	.78	1.55
66 inches	.19	.43	.60	.85	1.70
72 inches	.22	.47	.66	.93	1.85

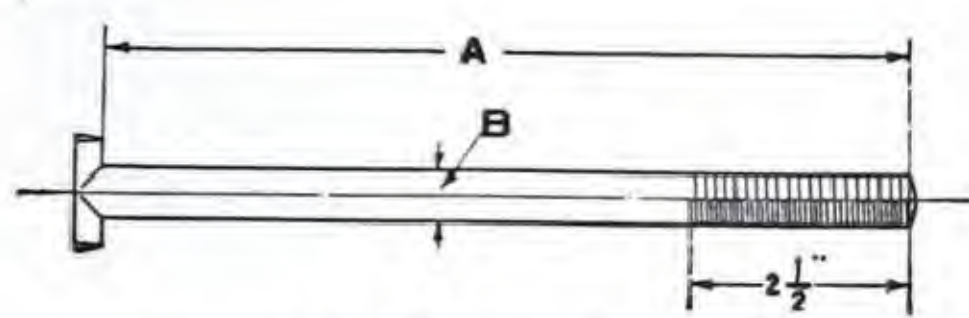
Square Head Hanger Rods are used in connection with the Grinnell Adjustable Insert, Fig. No. 152, shown on page 403, and with other types of Hangers. In the $\frac{3}{8}$ " size these rods are used in connection with Adjustable Clip Base shown on page 395 and with Center I Beam Clamp shown on page 409.

Square Head Hanger rods with or without machine thread $2\frac{1}{2}$ " long are stocked in sizes and lengths listed in table. In addition, $\frac{3}{8}$ " rods, Fig. No. 144, are stocked in lengths, by inches, from 6 inches to 24 inches, also in lengths $5\frac{1}{4}$, $5\frac{3}{4}$ and $6\frac{1}{8}$ inches used in the Adjustable Clip, Figure No. 106, shown on page 395. Should lengths not listed be desired they will be furnished at price for next longer length listed.

An additional charge will be made for threads longer than $2\frac{1}{2}$ ".

Order by Figure Number.

HANGERS

Grinnell Swinging Hanger Flange Rods

Swinging Hanger Flange Rod

Threaded—Fig. No. 146

Not Threaded—Fig. No. 147

LIST PRICES—Fig. Nos. 146, 147

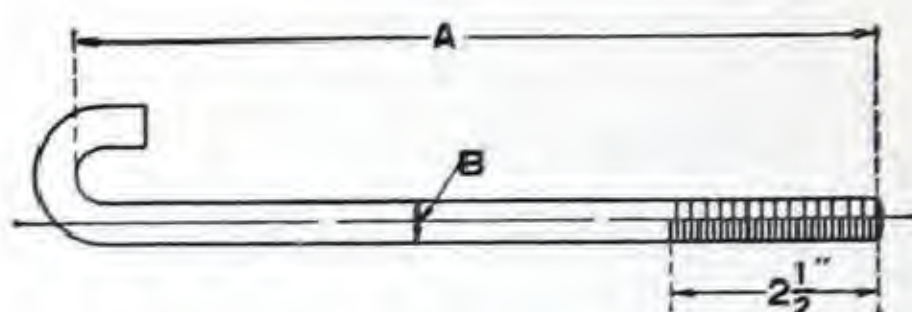
Length A	SIZE B				
	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$
8 inches	\$0.15	\$0.26	\$0.35	\$0.44	\$0.50
10 inches	.15	.26	.35	.44	.50
12 inches	.15	.26	.35	.47	.52
14 inches	.17	.28	.35	.54	.60
18 inches	.17	.33	.47	.62	.68
24 inches	.30	.38	.54	.70	.75
30 inches	.30	.43	.67	.84	.90
36 inches	.35	.48	.80	.97	1.05
42 inches	.35	.53	.90	1.05	1.20
48 inches	.40	.58	1.00	1.20	1.35
54 inches	.40	.63	1.10	1.30	1.50
60 inches	.45	.68	1.20	1.40	1.65
66 inches	.45	.73	1.30	1.50	1.80
72 inches	.50	.78	1.40	1.60	1.95

Special T headed rods to be used with the Swinging Hanger Flange, Fig. No. 158, shown on page 400 are stocked in sizes and lengths listed in table both with and without machine thread, $2\frac{1}{2}$ " long. Should special lengths be desired, they will be furnished at price for next longer length listed.

When Swinging Hanger Flange Rods are ordered with threads longer than $2\frac{1}{2}$ ", an additional charge will be made.

Order by Figure Number.

HANGERS

Grinnell Hook Rods

Hook Rod Threaded—Fig. No. 148

Not Threaded—Fig. No. 149

LIST PRICES

Length A	SIZE B				
	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$
8 inches	\$0 .08	\$0 .10	\$0 .18	\$0 .25	\$0 .30
10 inches	.08	.10	.18	.25	.30
12 inches	.08	.10	.18	.25	.30
14 inches	.10	.14	.24	.30	.40
18 inches	.10	.14	.24	.30	.40
24 inches	.12	.17	.30	.38	.50
30 inches	.14	.20	.36	.45	.60
36 inches	.16	.23	.42	.50	.70
42 inches	.18	.26	.48	.60	.80
48 inches	.20	.29	.54	.65	.90
54 inches	.22	.32	.60	.75	1 .00
60 inches	.24	.35	.66	.80	1 .10
66 inches	.26	.38	.72	.90	1 .20
72 inches	.28	.41	.78	.95	1 .30

Hook Rods are used as part of the Two-Pipe Adjustable Bracket, shown on page 443, and in connection with the Adjustable Hanger Plate, shown in Fig. X on page 424.

Hook Rods with or without machine thread $2\frac{1}{2}$ " long can be furnished in sizes and lengths listed in table. Should special lengths be desired, they will be furnished at price for next longer length listed.

When ordering $\frac{1}{2}$ ", $\frac{5}{8}$ ", or $\frac{3}{4}$ " Hook Rods separately for use with the Adjustable Two-Pipe Bracket, the length of thread on rod should be specified as 4".

An additional charge will be made for threads longer than 4".

Order by Figure Number.

HANGERS

Grinnell Pipe Threaded Coach Screws

Pipe Threaded Coach Screw
Fig. No. 111

LIST PRICES

No.	Price Each	Pipe Thread	Coach Screw Thread	Length
1	\$0.10	$\frac{1}{8}$	$\frac{3}{8}$	$3\frac{1}{2}$
2	.12	$\frac{1}{4}$	$\frac{1}{2}$	$3\frac{1}{2}$
3	.14	$\frac{3}{8}$	$\frac{5}{8}$	5
4	.20	$\frac{1}{2}$	$\frac{3}{4}$	5

The Pipe Threaded Coach Screw shown above is manufactured especially for use with hangers shown in this catalogue. The coach screw end has a blunt point while opposite end has standard pipe thread.

It is designed for use with Split Pipe Ring and Socket (Figure No. 107), page 396, and with Extension Split Ring (Figure No. 138), page 399.

This Coach Screw is made in four sizes carrying pipe threads $\frac{1}{8}$ " to $\frac{1}{2}$ " and coach screw threads $\frac{3}{8}$ " to $\frac{3}{4}$ ". Note that Coach Screws for $\frac{1}{8}$ " and $\frac{1}{4}$ " pipe thread are $3\frac{1}{2}$ " long and that for $\frac{3}{8}$ " and $\frac{1}{2}$ " pipe thread are 5" long.

Order by Figure Number.

Special Hanger Rods

In addition to the several types of hanger rods as listed above and on preceding pages, we will furnish upon order any special types of hanger rods desired.

These special types will include rods with welded eye or eyes, with turnbuckle, etc. Sketch giving information regarding size and length of rod and other details should accompany the order.

Prices on application.

SCREWS

Iron Wood Screws and Drive Screws



Wood Screw

List of July 18, 1922



†Drive Screw

LIST PRICES—PER GROSS

$\frac{1}{4}$ -inch No. Price	$\frac{3}{8}$ -inch No. Price	$\frac{1}{2}$ -inch No. Price	$\frac{5}{8}$ -inch No. Price	$\frac{3}{4}$ -inch No. Price	$\frac{7}{8}$ -inch No. Price	1-inch No. Price
0....\$.90	0....\$.90	1....\$.90	2....\$.90	2....\$.90	3....\$.95	3....\$.95
1.... .90	1.... .90	2.... .90	3.... .90	3.... .90	4.... .95	4....1.00
2.... .90	2.... .90	3.... .90	4.... .90	4.... .95	5....1.00	5....1.05
3.... .90	3.... .90	4.... .90	5.... .95	5.... .95	6....1.05	6....1.10
4.... .90	4.... .90	5.... .90	6.... .95	6....1.00	7....1.10	7....1.15
	5.... .90	6.... .90	7....1.00	7....1.05	8....1.15	8....1.20
	6.... .90	7.... .95	8....1.05	8....1.10	9....1.20	9....1.25
	7.... .90	8....1.00	9....1.10	9....1.15	10....1.25	10....1.30
	8.... .90	9....1.05	10....1.15	10....1.20	11....1.30	11....1.35
		10....1.10	11....1.20	11....1.25	12....1.35	12....1.40
			12....1.25	12....1.30	14....1.50	14....1.60
				14....1.40		16....1.85
<hr/>						
$1\frac{1}{4}$ -inch No. Price	$1\frac{1}{2}$ -inch No. Price	$1\frac{3}{4}$ -inch No. Price	2-inch No. Price	$2\frac{1}{4}$ -inch No. Price	$2\frac{1}{2}$ -inch No. Price	$2\frac{3}{4}$ -inch No. Price
4....\$1.10		6....\$1.40	6....\$1.55	6....\$1.75	6....\$1.95	8....\$2.15
5....1.15		7....1.45	7....1.60	7....1.80	7....2.00	9....2.25
6....1.20	4....\$1.20	8....1.50	8....1.65	8....1.85	8....2.05	10....2.45
7....1.25	5....1.25	9....1.60	9....1.75	9....1.95	9....2.15	11....2.60
8....1.30	6....1.30	10....1.70	10....1.85	10....2.05	10....2.25	12....2.80
9....1.35	7....1.35	11....1.80	11....2.00	11....2.20	11....2.40	14....3.25
10....1.40	8....1.40	12....2.00	12....2.20	12....2.40	12....2.60	16....3.80
11....1.50	9....1.45	14....2.25	14....2.50	14....2.75	14....3.00	18....4.45
12....1.60	10....1.50	16....2.60	16....2.90	16....3.20	16....3.50	20....5.20
14....1.80	11....1.60	18....3.05	18....3.40	18....3.75	18....4.10	
16....2.05	12....1.80	20....3.60	20....4.00	20....4.40	20....4.80	
18....2.40	14....2.05					
	16....2.35					
	18....2.75					
	20....3.25					
<hr/>						
3-inch No. Price	$3\frac{1}{4}$ -inch No. Price	4-inch No. Price	$4\frac{1}{4}$ -inch No. Price	5-inch No. Price		
8....\$2.45		12....\$3.80	14....\$5.10	14....\$5.75		
9....2.55	10....\$3.00	14....4.50	16....5.90	16....6.70		
10....2.65	11....3.20	16....5.20	18....6.90	18....7.80		
11....2.80	12....3.40	18....6.10	20....8.00	20....9.00		
12....3.00	14....4.00	20....7.10	24....10.70	24....11.90		
14....3.50	16....4.60	24....9.50				
16....4.10	18....5.40					
18....4.80	20....6.30					
20....5.60	24....8.40					
24....7.40						

†Drive Screws are regularly made in iron only, and with but one style of head. In use they are driven with a hammer, like nails, but have greater holding power and can be withdrawn with an ordinary screw driver.

They are made from $\frac{1}{2}$ to $3\frac{1}{2}$ inches in length and conform with listed diameters from No. 4 to No. 20 (screw gauge).

List Prices for drive screws are the same as those given above for wood screws in the same gauge.

SCREWS

Square Head Coach Screws

List Adopted January 2, 1924



Gimlet Point Coach Screw



Fetter Drive Coach Screw

LIST PRICES—PER HUNDRED

Diameter	$\frac{1}{4}$ & $\frac{5}{16}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{9}{16}$ & $\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1
$1\frac{1}{2}$	2.25	2.70	3.15	3.75	.....	.....	.....	.....
2	2.45	3.00	3.50	4.15	6.00	.....	.....	.....
$2\frac{1}{2}$	2.65	3.30	3.85	4.55	6.50	9.20	.....	.....
3	2.85	3.60	4.20	4.95	7.00	9.90	15.00	.....
$3\frac{1}{2}$	3.05	3.90	4.55	5.35	7.50	10.60	16.00	22.00
4	3.25	4.20	4.90	5.75	8.00	11.30	17.00	23.30
$4\frac{1}{2}$	3.45	4.50	5.25	6.15	8.50	12.00	18.00	24.60
5	3.65	4.80	5.60	6.55	9.00	12.70	19.00	25.90
$5\frac{1}{2}$	3.85	5.10	5.95	6.95	9.50	13.40	20.00	27.20
6	4.05	5.40	6.30	7.35	10.00	14.10	21.00	28.50
$6\frac{1}{2}$	5.25	6.70	7.65	8.75	10.50	14.80	22.00	29.80
7	5.45	7.00	8.00	9.15	11.00	15.50	23.00	31.10
$7\frac{1}{2}$	5.65	7.30	8.35	9.55	11.50	16.20	24.00	32.40
8	5.85	7.60	8.70	9.95	12.00	16.90	25.00	33.70
9	6.25	8.20	9.40	10.75	13.00	18.30	27.00	36.30
10	6.65	8.80	.....	11.55	14.00	19.70	29.00	38.90
11	.....	.....	.....	12.35	15.00	21.10	31.00	41.50
12	.....	.....	.....	13.15	16.00	22.50	33.00	44.10

Prices for the above made of either Copper, Muntz Metal, or Tobin Bronze given on application.

Hexagon Head Coach Screws made to order.

EXPANSION JOINTS

Brass Expansion Joints

125 Lbs. Steam Pressure



Brass Expansion Joint
Fig. Nos. 1301, 1302

STANDARD TRAVERSE—Fig. No. 1301

Size.....Inches	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3
Price.....Each	1.50	2.20	2.75	4.00	5.00	8.00	17.50	24.00
Traverse.....Inches	2 1/4	2 1/4	2 1/4	2 1/4	2 1/4	2 1/2	2 1/2	2 3/4
End to End, Open...Inches	6 3/8	7 1/4	7 3/8	7 3/8	7 5/8	8 3/8	9 1/8	10 3/8

SPECIAL TRAVERSE—Fig. No. 1302

Traverse Inches	Size	Inches	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2
4	Price.....Each		3.80	4.00	4.90	6.30	7.40	9.10	.....
6	Price.....Each		.....	8.25	9.00	10.00	11.50	13.50	24.00
8	Price.....Each		.....	9.00	10.00	11.25	13.00	15.50	27.00
10	Price.....Each		.....	9.75	11.00	12.50	14.50	17.50	30.00
12	Price.....Each		.....	10.50	12.00	13.75	16.00	19.50	33.00

Brass Steam Swing Joints



Brass Steam Swing Joint
Straight Pattern
Fig. No. 1303



Brass Steam Swing Joint
Angle Pattern
Fig. No. 1304

LIST PRICES—Fig. Nos. 1303, 1304

Size.....Inches	1/2	3/4	1	1 1/4	1 1/2	2
Price, Rough.....Each	2.50	3.50	5.00	6.50	9.00	13.00
Price, Finished.....Each	3.00	4.00	5.75	7.25	10.00	15.00

Expansion Joints are regularly furnished without packing. When wanted packed please specify kind of packing. An extra charge will be made for packing.
When ordering Special Traverse Expansion Joints, Fig. No. 1302, please state Traverse wanted.
Order by Figure Number.

EXPANSION JOINTS

Iron Body Brass Sleeve Expansion Joints

125 Lbs. Working Pressure



Iron Body Expansion Joint
Screwed—Fig. Nos. 1305, 1306, 1307

EASTERN (6-inch) TRAVERSE—Fig. No. 1305

Size.....Inches	2	2½	3	3½	4	4½	5
Price.....Each	11.00	13.00	17.50	25.00	30.00	40.00	45.00
End to End, Open.....Inches	18½	19¾	20	20¾	20½	21½	21¾
Size.....Inches	6	7	8	9	10	12	....
Price.....Each	55.00	70.00	100.00	110.00	160.00	225.00	....
End to End, Open.....Inches	22½	23½	24¾	25½	26½	27¾	....

STANDARD TRAVERSE—Fig. No. 1306

Size.....Inches	2	2½	3	3½	4	4½	5
Price.....Each	7.00	8.00	10.00	14.00	18.00	30.00	38.00
Traverse.....Inches	2½	2½	2¾	3	3¼	3½	4
End to End, Open.....Inches	11½	12¾	13½	14¾	15½	16½	17¾
Size.....Inches	6	7	8	9	10	12	....
Price.....Each	45.00	70.00	100.00	110.00	160.00	225.00	....
Traverse.....Inches	5	6	7	7	7	8	....
End to End, Open.....Inches	20½	23½	26¾	27½	28½	31¾	....

SPECIAL TRAVERSE—Fig. No. 1307

Traverse Inches	Size .....Inches	2	2½	3	3½	4	5	6	7	8
10	Price.....Each	16.00	19.00	25.00	35.00	42.00	62.00	80.00	100.00	140.00
12	Price.....Each	18.50	22.00	29.00	40.00	48.00	70.00	92.50	115.00	160.00
14	Price.....Each	21.00	25.00	33.00	45.00	54.00	78.00	105.00	130.00	180.00
16	Price.....Each	23.50	28.00	37.00	50.00	60.00	86.00	117.50	145.00	200.00
18	Price.....Each	26.00	31.00	41.00	55.00	66.00	94.00	130.00	160.00	220.00

Expansion Joints are regularly furnished without packing. When wanted packed please specify kind of packing. An extra charge will be made for packing.
Order by Figure Number.

EXPANSION JOINTS
Iron Body Brass Sleeve Expansion Joints
 125 Lbs. Working Pressure



Iron Body Expansion Joint
 Flanged—Fig. Nos. 1308, 1309, 1310

EASTERN (6 inch) TRAVERSE—Fig. No. 1308

Size.....Inches	2	2½	3	3½	4	5	6	7
Price.....Each	18.00	20.00	25.00	35.00	40.00	55.00	65.00	80.00
Face to Face, Open..Inches	18¾	18⅞	19⅞	19⅞	20¼	20⅝	21½	22⅞
Diameter of Flanges Inches	6	7	7½	8½	9	10	11	12½
Size.....Inches	8	10	12	14	16	18	20	24
Price.....Each	110.00	175.00	250.00	380.00	450.00	550.00	700.00	1000.00
Face to Face, Open..Inches	23⅞	25	26⅞	27½	29½	30	32½	38¼
Diameter of Flanges Inches	13½	16	19	21	23½	25	27½	32

STANDARD TRAVERSE—Fig. No. 1309

Size.....Inches	2	2½	3	3½	4	4½	5	6
Price.....Each	15.00	16.00	18.50	25.00	30.00	40.00	48.00	55.00
Traverse.....Inches	2½	2½	2¾	3	3¼	3½	4	5
Face to Face.....Inches	11¾	11⅞	12⅞	13⅞	14¾	15½	16⅞	19½
Diameter of Flanges Inches	6	7	7½	8½	9	9¼	10	11
Size.....Inches	7	8	9	10	12	14	15	16
Price.....Each	80.00	110.00	120.00	175.00	250.00	500.00	550.00	600.00
Traverse.....Inches	6	7	7	7	8	10	10	10
Face to Face.....Inches	22⅞	25⅞	26¼	27	30⅞	35½	35½	37½
Diameter of Flanges Inches	12½	13½	15	16	19	21	22¼	23½

SPECIAL TRAVERSE—Fig. No. 1310

Traverse Inches	Size	Inches	2	2½	3	3½	4	5	6	7
10	Price.....Each		23.00	26.00	32.50	45.00	52.00	72.00	90.00	112.00
12	Price.....Each		25.50	29.00	36.50	50.00	58.00	80.00	102.50	127.00
14	Price.....Each		28.00	32.00	40.50	55.00	64.00	88.00	115.00	142.00
16	Price.....Each		30.50	35.00	44.50	60.00	70.00	96.00	127.50	157.00
18	Price.....Each		33.00	38.00	48.50	65.00	76.00	104.00	140.00	172.00
Traverse Inches	Size	Inches	8	10	12	14	16	18	20	24
10	Price.....Each		150.00	225.00	300.00	500.00	600.00	750.00	925.00	1300.00
12	Price.....Each		170.00	255.00	345.00	560.00	675.00	850.00	1050.00	1475.00
14	Price.....Each		190.00	285.00	390.00	620.00	750.00	850.00	1175.00	1650.00
16	Price.....Each		210.00	315.00	435.00	680.00	825.00	1050.00	1300.00	1825.00
18	Price.....Each		230.00	350.00	480.00	740.00	900.00	1150.00	1425.00	2000.00

For list prices on drilling, see page 340.

Expansion Joints are regularly furnished without packing. When wanted packed please specify kind of packing. An extra charge will be made for packing.

Order by Figure Number.

EXPANSION JOINTS

*Double Expansion Joints**Iron Body—Brass Sleeve**125 Lbs. Working Pressure*

Double Expansion Joint—with Lateral Service Branch

Screwed—Fig. No. 1311

Flanged—Fig. No. 1312

Without Lateral Service Branch

Screwed—Fig. No. 1313

Flanged—Fig. No. 1314

LIST PRICES

Inches	2	2½	3	3½	4	4½	5	6
ce, Serd. or Flgd. without Service Branch..... Each	32.50	37.50	42.50	55.00	70.00	85.00	100.00	120.00
ce, Serd. or Flgd. with Service Branch..... Each	35.00	40.00	45.00	60.00	75.00	90.00	105.00	130.00
verse on each Sleeve..... Inches	4	4	4	4	4	4	4	4
vice Opening..... Inches	2	2	2	2	2½	2½	3	3
l to End, Open, Screwed..... Inches	28	28½	29½	30¾	31¾	32	32½	34
e to Face, Open, Flanged..... Inches	28	28½	29½	30¾	31¾	32	32½	34
meter of Flanges..... Inches	6	7	7½	8½	9	9¼	10	11

Inches	7	8	9	10	12	14	15	16
ce, Serd. or Flgd. without Service Branch..... Each	155.00	190.00	240.00	290.00	390.00	575.00	675.00	775.00
ce, Serd. or Flgd. with Service Branch..... Each	165.00	200.00	250.00	300.00	400.00	600.00	700.00	800.00
verse on each Sleeve..... Inches	4	4	4	3½	3½	3½	3½	3½
vice Opening..... Inches	4	4	4	4	4½	4½	5	5
l to End, Open, Screwed..... Inches	36¼	37¾	39¾	39¼	43	45	46½	48½
e to Face, Open, Flanged..... Inches	36¼	37¾	39¾	39¼	43	45	46½	48½
meter of Flanges..... Inches	12½	13½	15	16	19	21	22¼	23½

For List Prices on drilling, see page 340.

These Double Expansion Joints are suitable for most any purpose where a lengthy Traverse is required; but are designed especially for underground work. Are made of the same general proportions as the Standard Expansion Joints shown on preceding pages.

The Lateral Service Branch is located as far as possible above the center line, which construction permits dry steam to be taken from the main.

In ordering, be particular to state whether Screwed or Flanged Ends, Regular or Special Traverse desired.

Can be furnished in above sizes with 6-inch Traverse on each sleeve. Prices on application.

Expansion Joints are not furnished packed unless so ordered, and then at a special price. If ordered packed, be sure to specify kind of packing desired.

Order by Figure Number.

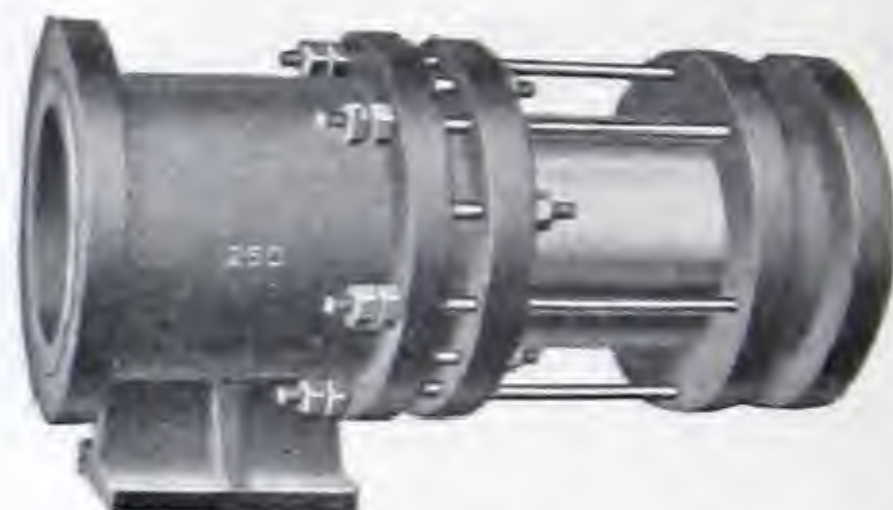
EXPANSION JOINTS

*Extra Heavy Iron Body Brass Sleeve Expansion Joint
With Tie Rods*

For 250 Lbs. Working Pressure



Iron Body Expansion Joint
Fig. Nos. 1315, 1316



Iron Body Expansion Joint
with Anchor Base
Fig. No. 1319
Prices on Application

STANDARD TRAVERSE—Fig. No. 1315

Size.....Inches	2	2½	3	3½	4	5	6	7
Price.....Each	35.00	45.00	55.00	65.00	75.00	85.00	105.00	125.00
Traverse.....Inches	2½	2½	2¾	3	3¼	4	5	6
End to End, Open...Inches	15½	16	17⅝	18⅞	19½	22⅜	25¾	28½
Diameter of Flanges..Inches	6½	7½	8¼	9	10	11	12½	14

Size.....Inches	8	9	10	12	14	15	16	18
Price.....Each	150.00	200.00	250.00	300.00	500.00	500.00	750.00	1000.00
Traverse.....Inches	7	7	7	8	10	10	10	10
End to End, Open...Inches	31½	31⅝	33⅝	37⅞	43	43⅞	45	46⅞
Diameter of Flanges..Inches	15	16¼	17½	20½	23	24½	25½	28

SPECIAL TRAVERSE—Fig. No. 1316

Traverse Inches	Size.....Inches	2	2½	3	3½	4	5	6	7	8
4	Price.....Each	40.00	50.00	60.00	70.00	80.00	90.00	100.00	110.00	120.00
6	Price.....Each	45.00	55.00	65.00	75.00	85.00	95.00	105.00	115.00	125.00
10	Price.....Each	50.00	60.00	70.00	80.00	90.00	100.00	110.00	120.00	130.00
12	Price.....Each	55.00	65.00	75.00	85.00	95.00	105.00	115.00	125.00	135.00
14	Price.....Each	60.00	70.00	80.00	90.00	100.00	110.00	120.00	130.00	140.00
16	Price.....Each	65.00	75.00	85.00	95.00	105.00	115.00	125.00	135.00	145.00

For list prices on drilling, see page 341.

Expansion joints are not furnished packed unless so ordered and then at a special price. If wanted packed be sure and specify the kind of packing desired.

The above expansion joints can be furnished with screwed ends in either the standard or special traverse. Prices on application.

Price for expansion joint with anchor base on application.

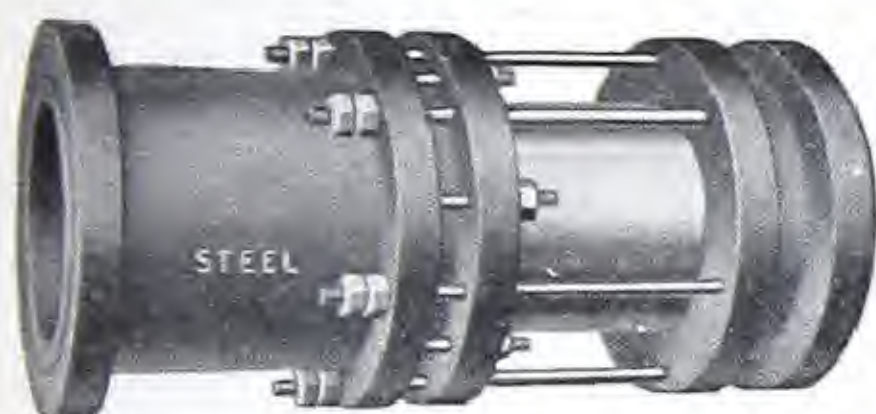
Order by Figure Number.

EXPANSION JOINTS

*Extra Heavy Cast Steel Expansion Joints**With Tie Rods*

*For Superheated Steam up to 350 Lbs. Working Pressure
and a Total Temperature of 800°F.*

For 500 Lbs. Cold Water Pressure and 400 Lbs. Hot Water Working Pressure



Steel Expansion Joint

Fig. No. 1320

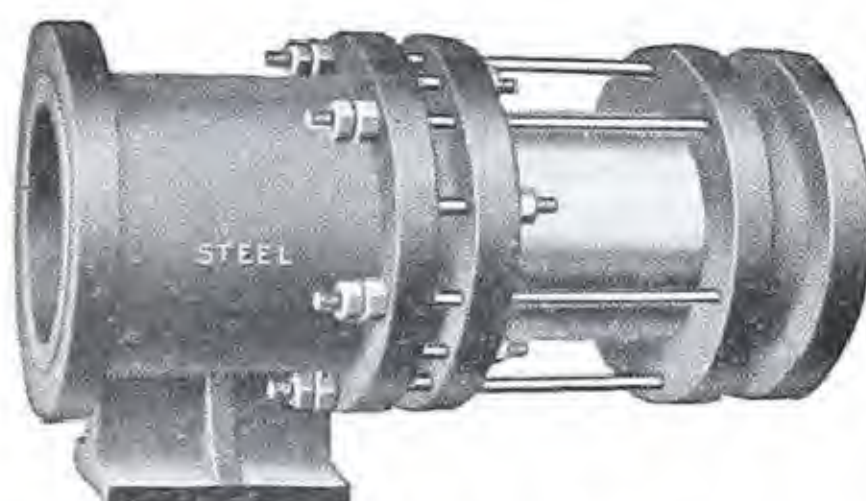
Steel Expansion Joint
With Anchor Base

Fig. No. 1321

Prices on Application

LIST PRICES

Size.....Inches	4	5	6	8	10	12
Construction A—Cast Steel Body, Gland and Spool. Body and Gland Bushed with Monel Metal. Sleeve made of Monel. Suitable for 350 pounds Superheated Steam working pressure with a total temperature of 800 degrees.....Each	150.00	175.00	200.00	250.00	325.00	400.00
Construction B—Cast Steel Body, Gland and Spool, with special Brass Sleeve, suitable for Water Working Pressures from 500 to 1000 lbs., according to size; 4", 1000 lbs.; 6 to 8", 800 lbs.; 10 and 12", 500 lbs.....Each	90.00	110.00	135.00	200.00	275.00	325.00
Traverse.....Inches	3 1/4	4	5	7	7	8
Face to Face, Flanged, opened.....Inches	19 1/2	22 3/8	25 3/4	31 1/2	33 5/8	37 1/6
Diameter of Flanges.....Inches	10	11	12 1/2	15	17 1/2	20 1/2

Expansion Joints for High Pressure Water Lines have Male Face on Flanges, for which an extra price is charged. See page 337.

Special price charged for these Expansion Joints made with longer Traverse than above. Templates for Drilling, page 276. Price List for Drilling, page 342.

Expansion Joints are not furnished packed unless so ordered, and then at a special price. If wanted packed, be sure to specify kind of packing desired.

Price of Expansion Joints with Anchor Base furnished on Application.

Order by Figure Number.

FIRE PROTECTION SPECIALTIES

*Fire Extinguishers**2 1/2 Gallon—Open Bottle Type—Underwriters' Labeled*

Fire Extinguishers are made of the best grade cold rolled copper and are built to give lasting service. They have been tested and approved by the Underwriters' Laboratories of the National Board of Fire Underwriters.

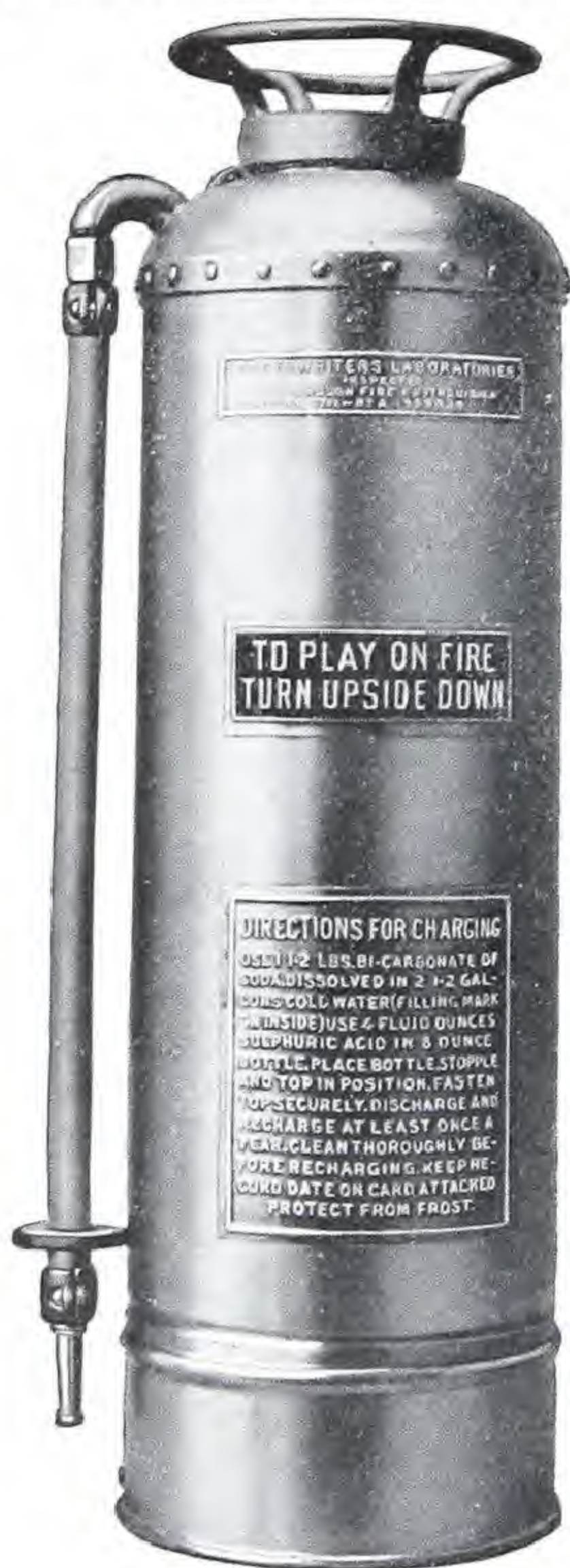


Fig. No. 1234

INSTRUCTIONS FOR OPERATION

- 1st:— Remove from wall hook or lift from floor and carry to the fire, holding extinguisher upright.
- 2nd:— When near fire, turn upside down. This causes mixture of chemicals inside the extinguisher producing sufficient pressure to force fire extinguishing liquid through hose.
- 3rd:— Direct stream from hose at base of fire.
- 4th:— To stop—turn the extinguisher right side up.

After extinguisher has been used it must be opened and thoroughly rinsed with clean water. It should then be recharged as follows:—

- (a) Dissolve $1\frac{1}{2}$ lbs. Bi-carbonate of Soda in $2\frac{1}{2}$ gallons of water. Fill the extinguisher with this solution up to the filling level mark on inside of extinguisher.
- (b) Pour four ounces of Sulphuric Acid into the glass bottle, insert the lead stopple. Place and fasten the bottle into the cage attached to inside of cover and screw the cover firmly on top of extinguisher.

Directions for recharging are on each Extinguisher.

Discharge and recharge at least once a year.

Wall hook and one charge of Soda and Acid furnished with each extinguisher. We recommend that one or more extra charges for each extinguisher be kept on hand for immediate use.

LIST PRICES

Price, Red Enamel Finish.....	Each	\$18.00
Price, Polished Copper Finish.....	Each	18.00
Price, Nickel Plate Finish.....	Each	20.00
Price, Chemical charges.....	Per Dozen	9.00

Order by Figure Number.

FIRE PROTECTION SPECIALTIES

Fire Extinguishers

Pyrene Fire Extinguisher



"Accurate" Pump Tank



Phomene Fire Extinguisher

LIST PRICES—Pyrene Fire Extinguisher

Brass Finish, 1 qt. capacity.....	Each	\$14.00
Brass Finish, 1½ qt. capacity.....	Each	18.00
Liquid Recharge, 1 qt. capacity.....	Each	2.00

LIST PRICES—"Accurate" Pump Tank

"Accurate" Pump Tank only. 5 gal. capacity.....	Each	\$20.00
"Accurate" Freeze Proof Compound Charge, to prevent freezing to 40 degrees below zero.....	Each	3.00

LIST PRICES—Phomene Fire Extinguisher

Polished Copper Finish, 2½ gal. capacity.....	Each	\$25.00
Liquid Recharges.....	Each	2.00

The Pyrene Fire Extinguisher is made in 1-quart and 1½ quart sizes. Labeled by the Underwriters' Laboratories. Compact, light, non-freezing; the liquid does not deteriorate. This extinguisher can be safely used on electrical fires without danger to the operator or damage to electrical equipment.

The "Accurate" Five Gallon Pump Tank is labeled by the Underwriters' Laboratories. It is fitted with heavy double action brass pump. Throws a continuous stream 40 to 50 feet. Charged with plain water for heated locations and with Freeze-proof Compound for unheated locations.

The Phomene Fire Extinguisher is labeled by the Underwriters' Laboratories. It is specially effective on oil, naphtha, gasoline, lacquer or paint fires, and any material of a highly inflammable nature.

A most important point when considering any device used for protecting a severe and very special hazard is simplicity of operation. This is accomplished in the Grinnell Foam Tank by the use of the Grinnell Foam Sprinkler which is the only mechanical element upon which the successful operation of the tank depends. Two chemical solutions are held in separate compartments of the tank until the Foam Sprinkler Head is opened by a fire, then the solutions combine and are discharged as a fire smothering foam, which upon reaching the volatile liquid surface below spreads out and covers the entire area with a heavy blanket thus extinguishing the fire.

To meet the general market conditions this device is made in four sizes; each size provides protection for a definite liquid surface area as indicated in the table which follows.

Special Booklet describing the Grinnell Automatic Foam Tank will be sent to those interested on request.

PRICES, DIMENSIONS, Etc.

SIZE OF TANK	No. 1	No. 2	No. 3	No. 4
Price includes two Grinnell Foam Sprinklers and two Chemical Charges.....	\$200.00	\$270.00	\$340.00	\$400.00
Extra Foam Sprinklers.....Each	9.00	9.00	9.00	9.00
Extra Chemical Charges.....Each	6.00	7.00	10.00	12.00
Covers a volatile liquid surface of..	15 sq.ft.	25 sq.ft.	50 sq.ft.	100 sq.ft.
Time required to empty tank.....	25 sec.	35 sec.	1 min., 15 sec.	2 min., 10 sec.
Weight, Full.....	190 lbs.	250 lbs.	450 lbs.	675 lbs.
Diameter of Tank.....Inches	14	14	18	22
Height of Tank.....Inches	17	25	33	36

A credit of \$0.50 each allowed for used Foam Sprinklers.
Order by Figure Number.

FIRE PROTECTION SPECIALTIES

Grinnell Fire Department Connections

Double Connection
Straight
Single Clapper
Fig. No. 1327



Double Connection
45° Angle
Single Clapper
Fig. No. 1328



Double Connection
90° Angle
Single Clapper
Fig. No. 1329



Double Connection
30° Angle
Double Clapper
Fig. No. 1330



Double Connection
60° Angle
Double Clapper
Fig. No. 1331



Single
Connection
Fig. No. 1332

Grinnell Fire Department Connections are made of best materials and are manufactured strictly to the specifications of Insurance Company requirements. Designed especially for use with Automatic Sprinkler Equipments and Stand Pipes. The double connections are provided with either single or double clappers making it possible to connect a second hose without shutting off the pressure from the first.

When ordering, please send sample of hose thread to be used.

LIST PRICES—Double Connections

Size	Inches	4x2½	4x3	6x3½
Fig. Nos. 1327, 1328, 1329 with Single Clapper	Bronze Body	\$25.00	\$30.00	.....
	Cast Iron Body . . .	20.00	.....	\$40.00
Fig. Nos. 1330, 1331 with Double Clappers	Bronze Body . . . .	.....	25.00	.....
	Cast Iron Body . . .	20.00	.....	.....

LIST PRICES—Single Connections

Size	Inches	3x2½	3x3	4x3½
Fig. No. 1332	Bronze Body	\$15.00	.....	.....
	Cast Iron Body . . .	12.00	\$12.00	\$17.00

Order by Figure Number.

Grinnell Hose Caps for Fire Department Connections



Grinnell Hose Cap
Fig. No. 1333

Grinnell Hose Caps are designed to prevent sprinkler or stand-pipe fire department connection openings from becoming clogged and to protect couplings and threads from injury. These Hose Caps are of the breakable type and can be easily and quickly removed by firemen by simply striking one of the projections at the side of the cap with a spanner wrench. Grinnell Hose Caps have been approved by the Underwriters' Laboratories.

LIST PRICES—Fig. No. 1333

Size	Inches	2½	3	3½
Each		\$1.00	\$1.50	\$3.00

Order by Figure Number.

FIRE PROTECTION SPECIALTIES

Grinnell Indicator Posts

The Grinnell Approved Indicator Posts Fig. No. 1335 are designed especially for use with water valves connected with fire service mains in mill and factory yards, etc., and comply with the specifications of the Associated Factory Mutual Fire Insurance Companies and the National Board of Fire Underwriters.

The Grinnell Indicator Post indicates at all times whether the valve is "Open" or "Shut" by means of a target or sign showing through a glass plate on either side of post near top.

This Post is designed for use with all makes of Underwriters approved non-rising spindle gate valves, opening either to right or left, and requiring from 8 to 41 turns to open. This range includes 4" to 12" valves.

We furnish Posts and Valves assembled complete for water pressures up to 150 pounds, for any depth of trench and with a Sealing Wrench which wrench also acts as a locking bar, and when so used each post carries its own wrench.

The Grinnell Standard Indicator Posts, Fig. No. 1336, although not approved by either the Mutuels or the National Board, have been widely used and are acceptable to some insurance interests. These Posts operate in the same general manner as the Approved Posts, cover the same range of sizes and have the same type of locking device.

Unless otherwise specified all posts are equipped with operating nut $1\frac{1}{4}$ -inch square and turn to left to open.



Approved Post
Fig. No. 1335



Standard Post
Fig. No. 1336

LIST PRICES—Fig. Nos. 1335, 1336

Indicator Post only, Fig. Nos. 1335, 1336, 5-foot Trench	Each	\$70.00
Extra for each 6-inches over 5-foot Trench		3.25
Deduct for each 6-inches less than 5-foot Trench.		2.25
Sealing Wrench.	Each	3.25

Note:—Depth of Trench is measured from bottom of pipe to ground line.

Order by Figure Number and specify whether valves open to "Right" (clockwise) or "Left" (counter-clockwise), depth of trench, size of valve, and size and shape of operating nut.

FIRE PROTECTION SPECIALTIES

Grinnell Surface Hydrants and Special Six-Inch Fire Pump Hose Connections

Iron Body



Double Valve Hydrant
Straight Pattern
Fig. No. 1337

Bronze Mounted



Double Valve Hydrant
Angle Pattern
Fig. No. 1338



Special Six-Inch Hose Connection
For Fire Pumps
Fig. No. 1339

LIST PRICES

Fig. No. 1337 Double Valve Hydrant, Straight Pattern	Each	\$46.00
Fig. No. 1338 Double Valve Hydrant, Angle Pattern	Each	46.00
Fig. No. 1339 Special Six-Inch Hose Connection for Fire Pumps	Each	75.00

Fig. Nos. 1337 and 1338 are furnished with 4-inch inlet, flanged and drilled to American standard, with two 2 1/2-inch hose outlets with caps.

Fig. No. 1339 is designed to avoid the cumbersome fittings usually used. It is furnished complete tapped for 6-inch pipe and with three 2 1/2-inch Iron Body, Bronze Mounted Hose valves, Caps and Chains.

When ordering, please send sample of hose thread to be used.

Order by Figure Number.

FIRE PROTECTION SPECIALTIES

*Kennedy Newtype Fire Hydrants**Iron Body, Bronze Mounted**Leather Disc—Compression Type—Inside Stationary Stem**150 Lbs. Water Pressure*

GROUND

LINE

Fig. No. 108

Manufactured under specifications of
American Water Works Association



Fig. No. 110

View of top of Hydrant showing 2½-inch Independent Hose Gate Valves bolted on nozzles.

Hydrants can also be furnished with Inside Independent Hose Gate Valves.

See opposite page for dimensions, also Number and Style of Nozzles.

One Hydrant Wrench with Spanner furnished without charge with each order for Hydrants, or with every six Hydrants on orders exceeding that quantity. Extra Wrenches, \$0.60 Net.

LIST PRICES

Hydrants for 5-ft. trench, having one or two hose nozzles and with either 4-inch or 6-inch hub, standard pipe connections. Without Frost Cases.		Each
Nominal Size of Hydrant.	Price Each	6-inch Variation
4-inch	\$90.00	\$2.00
5-inch	114.00	3.00
6-inch	140.00	3.50

FIRE PROTECTION SPECIALTIES

Kennedy Newtype Fire Hydrants

(Continued)

HYDRANT DIFFERENTIALS

Extra Steamer Nozzle.....	\$11.00 per Nozzle
Extra Hose Nozzle.....	4.50 per Nozzle
Inside Hose Nozzle Valve.....	15.00 per Valve
Outside Hose Nozzle Valve.....	23.00 per Valve
Inside Steamer Nozzle Valve.....	24.00 per Valve
Outside Steamer Nozzle Valve.....	44.00 per Valve
Extra for Jones or Fehy Couplings.....	3.00 per Coupling
Extra for Anderson Coupling.....	5.00 per Coupling
Extra for 8-inch Hub Connection.....	2.00 per Hydrant

Add to list for Flanged, Universal or Wood Pipe Joints, 4-inch and smaller, \$2.00; 5-inch, \$2.50; 6-inch, \$3.00; 8-inch, \$3.50.

DIMENSIONS, ETC.

Nominal Size of Hydrant.....Inches	4	5	6
Actual Diameter of Inlet Valve.....	4 $\frac{1}{4}$	5 $\frac{1}{4}$	6 $\frac{1}{4}$
Inside Diameter of Stand-Pipe.....	6	7	8 $\frac{1}{4}$
Distance from Ground Line to Center of Nozzle.....	17	18	18
Distance from Center of Nozzle to Top of Hydrant.....	13	14 $\frac{1}{4}$	15 $\frac{1}{2}$
Distance from Ground Line to Top of Hydrant.....	30	32 $\frac{1}{4}$	33 $\frac{1}{2}$

Number and Style of Nozzles		Com- bined Area of Nozzles Inches	Size of Inlet Valve		Inside Diameter of Stand-Pipe		Surplus Area of Stand- Pipe Over Inlet Valve	Size of Main Con- nec- tion Inches
2 $\frac{1}{2}$ -in. Hose	Steamer		Size Inches	Net Area Inches	Size Inches	Net Area Inches		
One		4.91	4 $\frac{1}{4}$	13.02	6	27.27	109%	4 or 6
Two		9.81						
One	One	17.48						
Two	One	22.38	5 $\frac{1}{4}$	20.65	7	37.48	82%	6 or 8
Two		9.81						
Three		14.73						
One	One	17.48	6 $\frac{1}{4}$	29.30	8 $\frac{1}{4}$	52.23	69%	6 or 8
Two	One	22.38						
Three		14.73						
Four		19.63	6 $\frac{1}{4}$	29.30	8 $\frac{1}{4}$	52.23	69%	6 or 8
Two	One	22.38						
Three	One	27.30						

When ordering please send sample of hose thread to be used.

FIRE PROTECTION SPECIALTIES

*Kerr Slide Gate Fire Hydrants**Bronze Mounted, Rubber Faced Gate, with Drip Valve*

All parts are interchangeable.

These hydrants are made with independent Shut-offs on the nozzles when required.

This hydrant is perfect without frost case, and therefore this outer jacket is unnecessary.

BRONZE MOUNTINGS

All the bearings are fully bronze mounted, the mountings consisting of the following parts:—Seat Rings, Drip Cup, Drip Valve, Lower or Threaded Section of Stem, Wedge Nut, Plate holding Rubber Gasket in Gate, Bevel Nut in Back of Gate, Sleeve fitting on top of stem and nozzle.

FIRE PROTECTION SPECIALTIES

Kerr Slide Gate Fire Hydrants

(Continued)

DRIP VALVE

The Drip Valve is of bronze, faced with rubber, and is screwed to lower end of hydrant stem, and works in a bronze cup set in the extreme bottom of the hydrant.

It is adjustable, and will always set properly, is positive in its action, and allows hydrant barrel to drain completely, leaving no water standing in it to freeze.

It opens only after the Gate is closed and wedged, and it closes before the Gate is released from its seat or any water enters the barrel of hydrant.

It cannot become clogged as it never leaves the drip cup, and revolves with every movement of the stem.

There is no wear or grinding on the rubber with which it is faced, as the lower part ceases to move as soon as the valve comes to its seat, the upper part only continuing to revolve with stem until the gate is forced to its seat.

Both the Gate and Drip Valve are faced with heavy solid special rubber gaskets, making a very superior valve.

TO TAKE OUT WORKING PARTS

All the working parts can be removed without disturbing barrel of hydrant or doing any digging, by simply removing the wrench nut or dome, and packing plate at top of hydrant, when all the working parts, gate complete, bronze wedge nut, and drip valve are drawn out with the stem, leaving a clear hydrant barrel.

All parts are strong and durable and made of first-class material; but should it ever become necessary to repair these hydrants it is easily accomplished, and costs little to do.

DIMENSIONS

Diameter of Seat Ring or Valve Opening	Inches	4½	4½
Inside Diameter of Stand Pipe	Inches	6¼	6¼
Size of Connecting Pipe, Hub End	Inches	4	6

See Instructions for Ordering Hydrants on page 500.
Prices on Application.

FIRE PROTECTION SPECIALTIES

Instructions for Ordering Hydrants

Orders and Inquiries can be handled quickest only when the following particulars are given:

1. Number and size of Hose Nozzles. Be sure and specify if Independent Outside or Independent Inside Nozzle Gates are wanted.
2. Number and size of Steamer Nozzles, if any. Be sure and specify if Independent Outside or Independent Inside Nozzle Gates are wanted.
3. Depth of Trench, which is distance from ground line or pavement at Hydrant to bottom of pipe connection. When Hydrants are for use with Hydrant Houses with floors, add the height of floor above the ground to the usual "Depth of Trench."
4. Size of Inlet Valve.
5. Size of connection to main.
6. Whether Hydrant is to have Bell, Screwed, Flanged, or Wood Pipe connection.
7. Size and shape of Operating Nut at top (nozzle caps generally have nuts corresponding to top nut, so that one wrench operates all).
8. Number of Hydrant Operating Wrenches wanted.
9. Hose Thread. When ordering, please send sample of Hose Thread to be used. The sample should preferably be a hose coupling complete, including the male and female threaded ends.
10. Frost Casing. Most Hydrants are now furnished without Frost Casing. If wanted with Frost Casing, so specify.

FIRE PROTECTION SPECIALTIES

Grinnell Hose Valves

Approved Angle Hose Valve
Bronze Body, Renewable Disc
Fig. No. 1340



Hose Gate Valve
Iron Body, Bronze Mounted
With Cap and Chain
Fig. No. 1341

The approved Angle Hose Valve, Fig. No. 1340, is made to the specifications of the Associated Factory Mutual Fire Insurance Companies and is approved for use on standpipes or wherever a high grade hose valve is desired.

The Hose Gate Valve, Fig. No. 1341, is made with single seat and is acceptable to all insurance interests for use on hydrants or other outside connections.

LIST PRICES

Angle Hose Valve, 2½-inch, Fig. No. 1340	\$22.00
Hose Gate Valve, 2½-inch, Fig. No. 1341	12.00
Fig. No. 1340, Center of Outlet to End of Inlet.	Inches 3¼
Fig. No. 1340, Center of Outlet to Top of Wheel, Open	Inches 10⅝
Fig. No. 1341, Center to Top of Wheel	Inches 8¾
Fig. No. 1341, Center to Center of Bolts.	Inches 5⅝

When ordering, please send sample of hose thread to be used.

Order by Figure Number.

FIRE PROTECTION SPECIALTIES

Jenkins Brass Globe and Angle Hose Valves

250 Lbs. Water Working Pressure



Globe Hose Valve

With Cap and Chain—Fig. No. 114-A

Without Cap or Chain—Fig. No. 113
(Not Illustrated)

Angle Hose Valve

Without Cap or Chain—Fig. No. 112

With Cap and Chain—Fig. No. 114
(Not Illustrated)

LIST PRICES—Fig. Nos. 112, 113

Size.....	Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Rough Body, Fin. Trim, Iron Wheel....	Each	2.10	2.70	3.30	4.70	6.50	9.90	17.10	23.50
Rough Body, Fin. Trim, Brass Wheel....	Each	2.75	3.35	4.00	5.50	7.50	12.00	20.00	26.50
Finished all over, Brass Wheel.....	Each	3.20	3.90	4.60	6.20	8.40	12.50	22.50	30.00
Rough Body, Plated all over, Brass Wheel Ea.		3.20	3.80	4.40	5.90	7.90	12.40	20.60	27.10
Finished and Plated all over, Brass Wheel Ea.		3.60	4.20	5.00	6.60	8.80	13.00	23.00	31.00

LIST PRICES—Fig. Nos. 114, 114A

Size.....	Inches	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Rough Body, Fin. Trim, Iron Wheel.....	Each	4.50	5.50	7.00	9.50	15.00	22.00	30.00
Rough Body, Fin. Trim, Brass Wheel.....	Each	5.15	6.25	7.80	10.50	16.50	24.80	32.80
Finished all over, Brass Wheel.....	Each	5.55	6.65	8.20	10.90	16.90	25.40	33.40
Rough Body, Plated all over, Brass Wheel... Each		6.00	7.00	8.70	11.70	16.80	27.50	36.50
Finished and Plated all over, Brass Wheel... Each		6.40	7.40	9.00	12.00	17.20	28.00	37.50

Jenkins Globe and Angle Hose Valves are fitted with Jenkins Discs of pliable rubber composition specially adapted for cold water service, ensuring tightness under pressure, and freedom from corrosion, or sticking at the seat.

Prices on Hose Valves with flanged inlet furnished on application.

When ordering please send sample of hose thread to be used.

Order by Figure Number. Specify finish.

FIRE PROTECTION SPECIALTIES

*Jenkins Brass Hose Gate Valves**Type "K," Double Disc, Taper Seats**150 Lbs. Water Pressure*

Inside Screw, Stationary Stem

Without Cap or Chain—Fig. No. 303

With Cap and Chain—Fig. No. 304
(Not Illustrated)

†Outside Screw and Yoke

With Cap and Chain—Fig. No. 306

Without Cap or Chain—Fig. No. 305-B
(Not Illustrated)

LIST PRICES—Fig. No. 303

Size.....Inches	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Rough Body, Fin. Trim., Iron Wheel.....Each	2.45	3.35	4.70	6.25	9.00	15.00	22.00
Rough Body, Fin. Trim., Brass Wheel.....Each	3.70	5.20	6.85	8.85	12.30	18.70	27.30
Finished all over, Brass Wheel.....Each	5.20	6.90	9.10	11.85	17.30	26.00	38.00
Rough Body, Plated all over, Brass Wheel...Each	4.20	5.80	7.55	9.65	13.30	19.95	29.00
Finished and Plated all over, Brass Wheel...Each	5.70	7.50	9.80	12.65	18.30	27.25	39.75

LIST PRICES—Fig. No. 304

Size.....Inches	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Rough Body, Fin. Trim., Iron Wheel.....Each	3.95	5.10	6.70	8.85	12.60	20.00	29.50
Rough Body, Fin. Trim., Brass Wheel.....Each	5.20	6.95	8.85	11.45	15.90	23.70	34.80
Finished all over, Brass Wheel.....Each	6.70	8.65	11.10	14.45	20.90	31.00	45.50
Rough Body, Plated all over Brass Wheel...Each	5.70	7.55	9.55	12.25	16.90	24.95	36.50
Finished and Plated all over, Brass Wheel...Each	7.20	9.25	11.80	15.25	21.90	32.25	47.25

LIST PRICES—Fig. Nos. 305-B, 306

Rough Body, Finished Trimmings, Iron Wheel

Size.....Inches	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Fig. No. 305-B.....Each	\$9.00	10.50	12.25	16.25	23.25	34.50	41.50
Fig. No. 306.....Each	9.75	11.10	13.50	17.72	25.00	36.25	43.50

†Sizes $\frac{3}{4}$ to 2-inches inclusive are Underwriters' Approved Patterns and bear identification mark "F.M."

Prices on Hose Valves with flanged inlet furnished on application.

When ordering, please send sample of hose thread to be used.

Order by Figure Number. Specify Finish.

FIRE PROTECTION SPECIALTIES

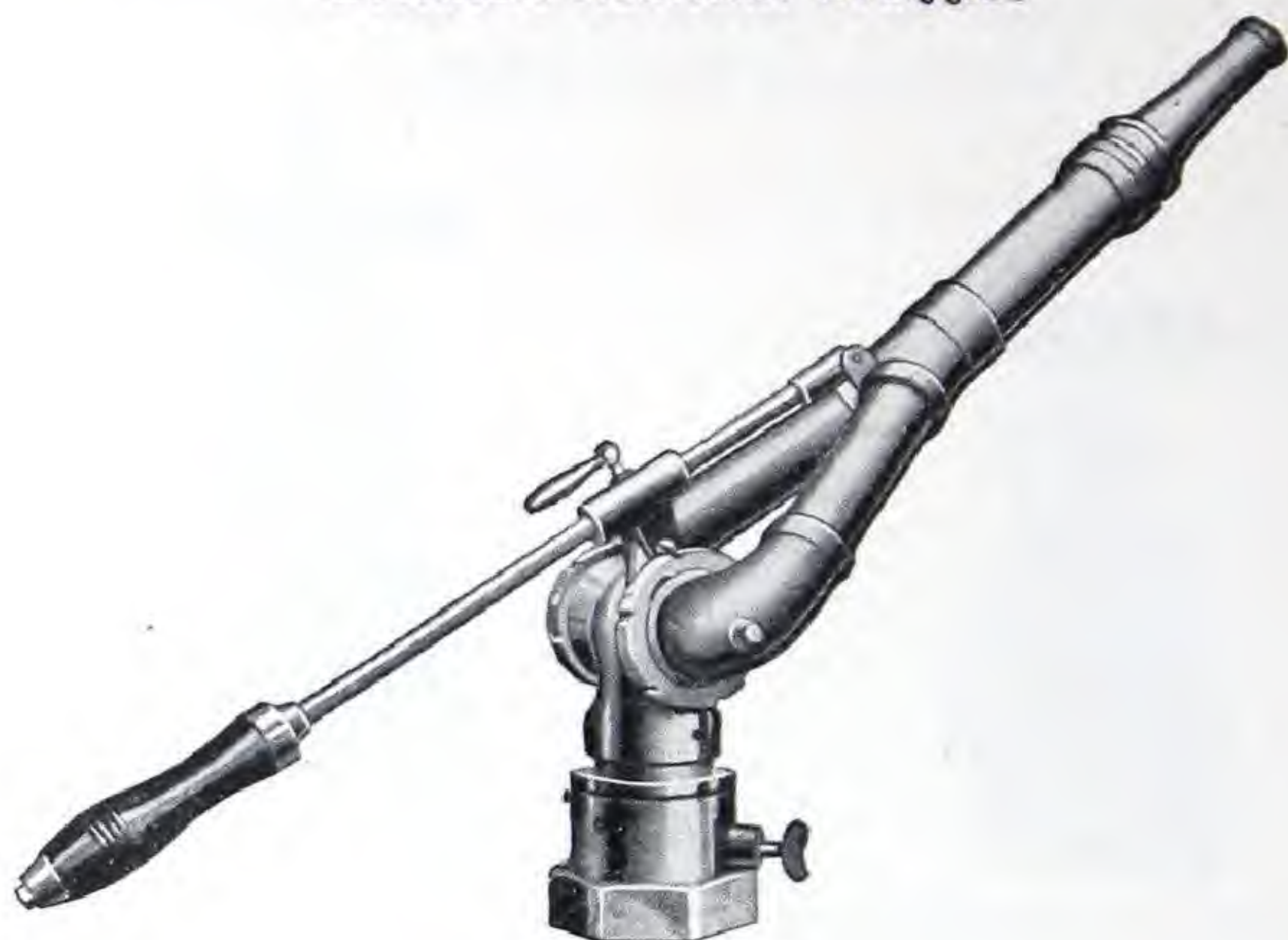
Grinnell Monitor Nozzles

Fig. No. 1342

This Monitor Nozzle is for use in Car and Lumber Yards, Cotton Storage and other outside properties. Scientifically designed with perfect balance, it can be easily operated by one man. The handle on the Nozzle enables the operator to change the direction of the water stream as desired.

Manufactured of best grade of brass tubing and bronze castings, it can be furnished in red enamel finish, polished brass or nickel plated.

The Monitor Nozzle is furnished in red enamel finish with handle as illustrated, with standard $1\frac{1}{8}$ -inch tip and 4-inch pipe connection unless otherwise specified. However, tip can be furnished as small as $\frac{3}{4}$ -inch if desired, while pipe connection can be $3\frac{1}{2}$, 3 or $2\frac{1}{2}$ -inch.

LIST PRICES

Red Enamel Finish—with handle	Each	\$100.00
Red Enamel Finish—without handle	Each	90.00
Polished Brass—with handle	Each	120.00
Polished Brass—without handle	Each	110.00

Order by Figure Number.

FIRE PROTECTION SPECIALTIES

Hose Pipes*Underwriter Play Pipes*

Fig. No. 1343

2½ x 30-inch—Standard Discharge, 1⅛-inch Screw Tip, Swivel Handle, Marlin Wound and painted red. The word "UNDERWRITER" stamped in black on the red paint.
Price, Each \$15.00

Swivel Handle Play Pipes—Fig. No. 1344

Screw Tip, Swivel Handle, and either wound and painted or plain brass tube.

Same general construction and design as Underwriter Play Pipe, but covers range of sizes not included in Underwriters' specifications.

LIST PRICES—Fig. No. 1344

Size.....Inches	2	2½	2½	2½
Length.....Inches	20	24	30	36
Wound and Painted.....Each	\$12.25	\$14.00	\$15.00	\$19.00
Plain Brass.....Each	10.75	12.50	14.00	18.00

*Brass Hose Pipes*

Solid Tip—Fig. No. 1345

LIST PRICES—Fig. No. 1345

Size.....Inches	1	1¼	1½	2
Length.....Inches	4	12	12	12
Discharge.....Inches	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{9}{16}$
Hose or I.P. Thread.....Per Doz.	\$9.00	\$20.00	\$25.00	\$40.00
Size.....Inches	2½	2½	2½	2½
Length.....Inches	12	15	18	22
Discharge.....Inches	1	1	1½	1½
Hose or I.P. Thread.....Per Doz.	\$70.00	\$80.00	\$100.00	\$120.00

*Brass Hose Pipes*

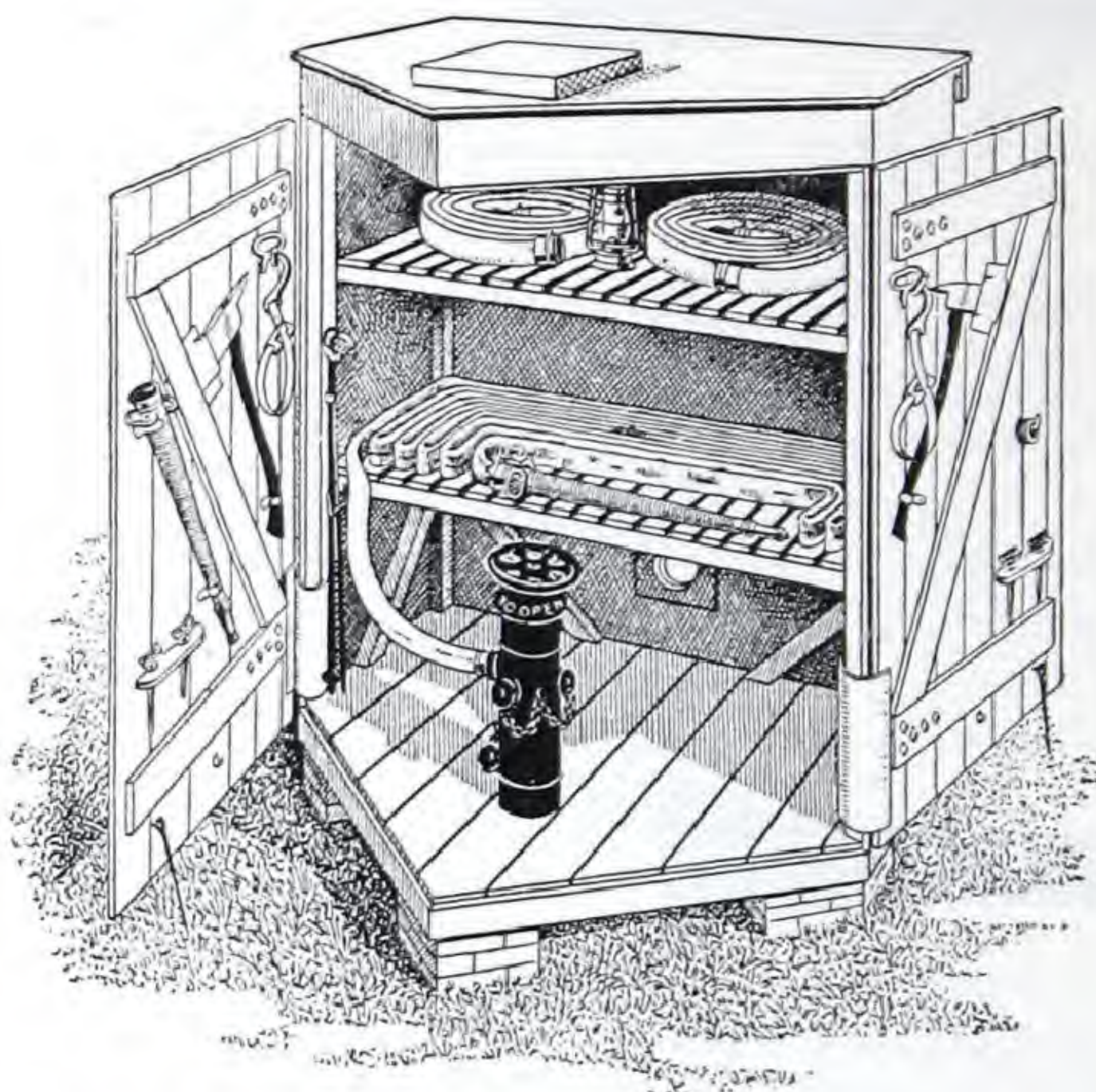
Screw Tip—Fig. No. 1346

LIST PRICES—Fig. No. 1346

Size.....Inches	1	1	1¼	1¼	1½	1½
Length.....Inches	8½	12½	12	15	13	15
Discharge.....Inches	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$
Hose or I.P. Thread...Per Doz.	\$12.00	\$14.50	\$24.00	\$29.00	\$30.00	\$36.00
Size.....Inches	2	2	2	2½	2½	2½
Length.....Inches	12	15	20	15	20	24
Discharge.....Inches	$\frac{5}{8}$	$\frac{5}{8}$	$\frac{5}{8}$	$\frac{5}{8}$	1	1
Hose or I.P. Thread...Per Doz.	\$46.00	\$54.00	\$60.00	\$90.00	\$115.00	\$120.00

When ordering please send sample of hose thread to be used.
Order by Figure Number.

FIRE PROTECTION SPECIALTIES

Hose and Hydrant Houses with Equipment

BEST EQUIPMENT FOR A HOSE HOUSE

One hundred feet cotton rubber-lined approved hose always coupled to hydrant and with playpipe attached.

At least 100 feet extra hose on upper shelf coiled as shown.

Two axes, 2 bars, 4 spanners, 1 additional standard Underwriter playpipe, 2 ladder straps, 1 playpipe holder, and 1 heavy mill lantern.

One wrench to be always kept on hydrant, and a spare one provided for emergency. Large hand wheels on all yard hydrants are, however, the best.

Price on complete equipment or individual parts on application.

When Hydrants are to be used with Hydrant Houses with floors as illustrated above, the height from ground to floor level should be added to the usual "Depth of Trench" when ordering Hydrants.

FIRE PROTECTION SPECIALTIES

Wirt's Royal Hose Racks

Semi-Automatic



With Pipe Clamp
Fig. No. 707



With Wall Bracket
Fig. No. 708
Sectional View Showing
Construction of Rack

LIST PRICES—Fig. Nos. 707, 708

Capacity, Unlined Linen Hose Size Number	25 to 75 Feet			100 to 150 Feet		
	18X	18Y	18Z	19X	19Y	19Z
Size of Hose Inches	1½	2	2½	1½	2	2½
Lacquered Red on Steel . . Each	\$7.75	\$7.75	\$7.75	\$9.25	\$9.25	\$9.25
Gold, Copper or Aluminum Bronze on Steel Each	7.75	7.75	7.75	9.25	9.25	9.25
White Enamel on Steel . . Each	9.25	9.25	9.25	11.00	11.00	11.00
Nickel or Copper-plate on Steel	Prices on application.					
Solid Brass Polished or Nickel-plated						

The Royal Rack is semi-automatic—that is, it can be operated by turning on the water before pulling off the hose, making the rack also “fool-proof,” or should a valve be opened maliciously the water will be held back until noticed.

The rack is made of pressed steel and malleable iron, has a covered top and rust-proof pins of large diameter. Pins permanently attached. Dust and dirt cannot accumulate on the top fold of the hose, and the loose folds allow ventilation, preventing mildew and rot.

Furnished in red finish and with wall bracket if not otherwise specified. List price includes wall bracket or pipe clamp, the latter not over 4 inches. ½-inch, 5-inch, 6-inch, each, extra.

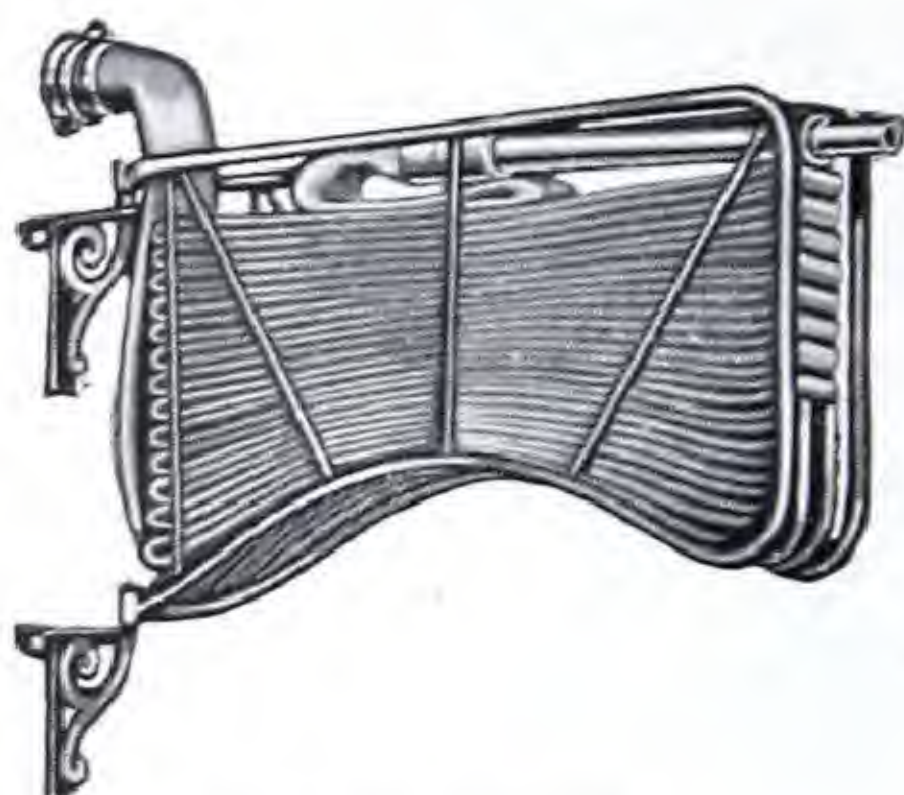
For racks to be attached to valve, nipples are furnished only when specified. Plain pipe nipples, with iron pipe thread, without extra charge when in same finish as racks. Nipples, with special or hose thread, are as follows: Cast-iron nipples, 1½-inch, 2-inch, 2½-inch, extra.

Order by Figure Number and Size Number.

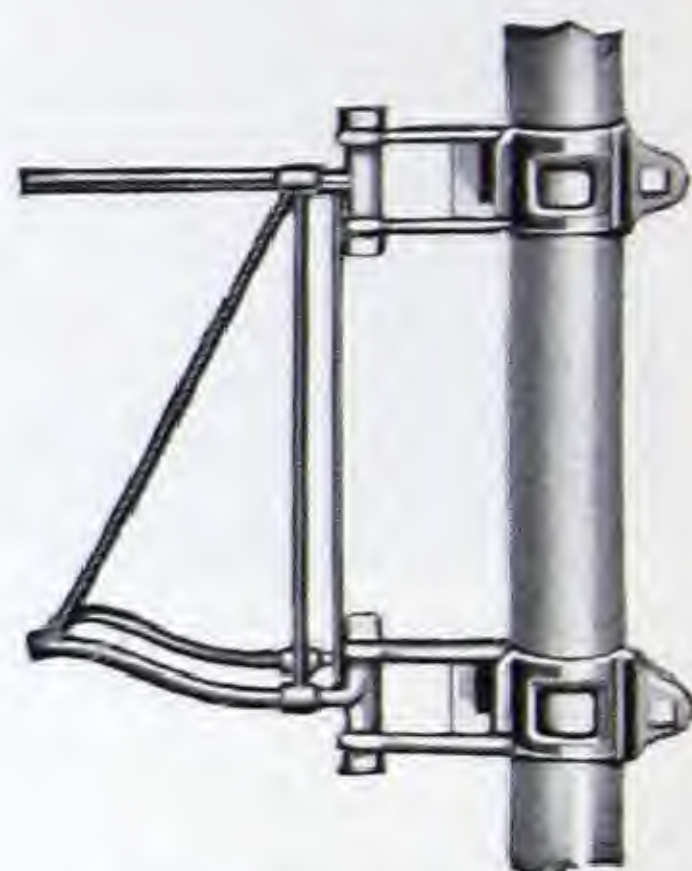
FIRE PROTECTION SPECIALTIES

LaFrance Hump Hose Rack

Style T



With Wall Bracket
Fig. No. 711



With Pipe Clamp
Fig. No. 712

LIST PRICES—Fig. Nos. 711, 712

Size Number	Size of Hose, Inches	Capacity, Unlined Linen Hose	Capacity, Cotton Mill Hose	Price, Each
A0	1¼ or 1½	50 feet	.....	\$6.25
A0X	2	50 feet	.....	6.25
A00	2½	50 feet	.....	6.25
A075	1¼ or 1½	75 feet	.....	7.00
A0X75	2	75 feet	.....	7.00
A0075	2½	75 feet	.....	7.00
A1	1¼ or 1½	100 feet	25 feet	7.50
A1X	2	100 feet	25 feet	7.50
A2	2½	100 feet	25 feet	7.50
A3	1¼ or 1½	150 feet	50 feet	8.75
A3X	2	150 feet	50 feet	8.75
A4	2½	150 feet	50 feet	8.75

Made of Malleable Iron and Steel.

Approved by the Associated Factory Mutual Fire Insurance Companies.

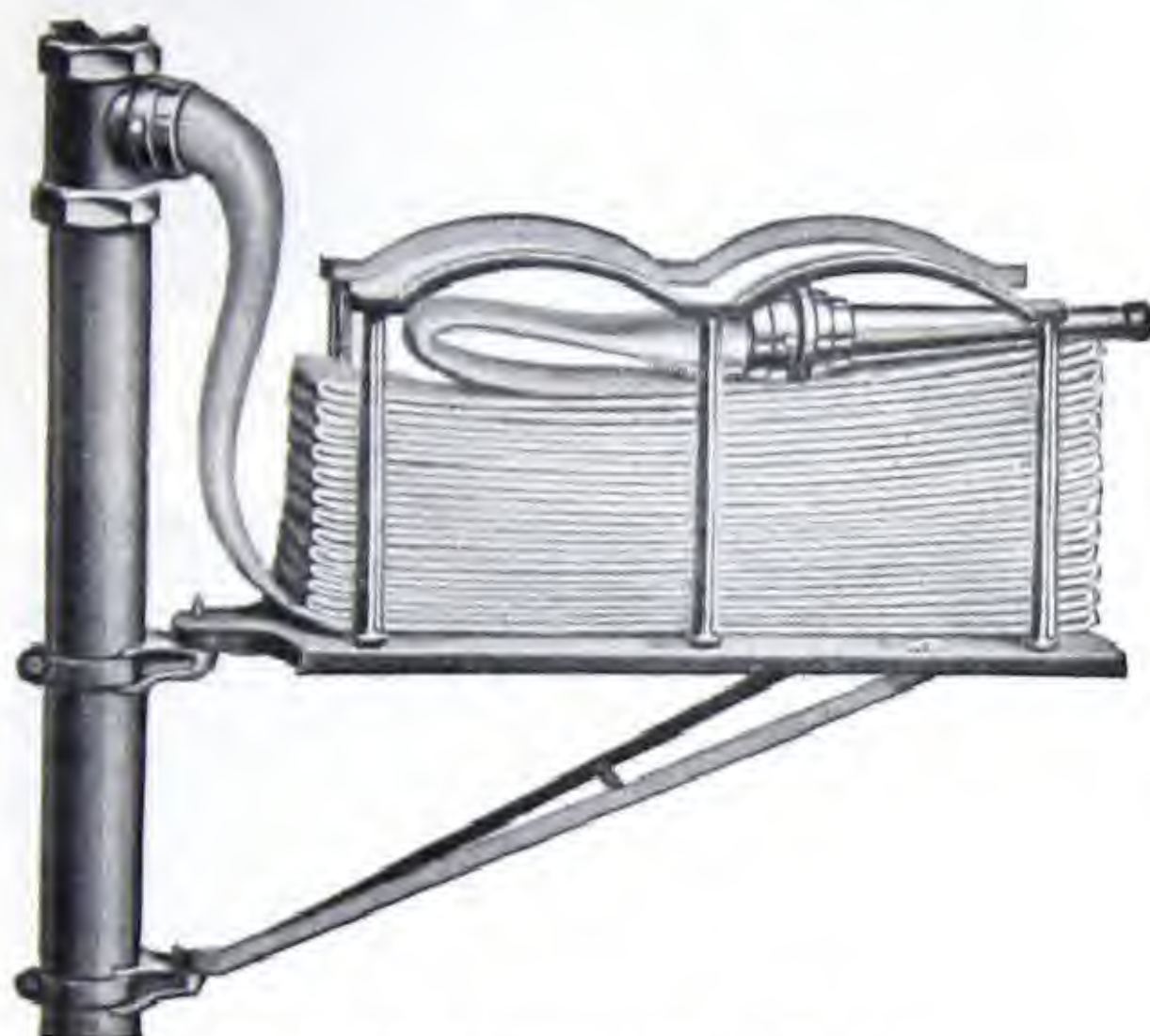
The hump in the bottom of these racks prevents a sharp crease at the ends of the folds of hose, which results in breaks in the hose.

The front is partially enclosed, which prevents the slack of hose from sliding out bodily and tangling up when drawn off.

Japaned red, unless otherwise specified. Furnished in gold or aluminum bronze if desired, without extra charge; finished in nickel or copper plate at an additional cost.

Order by Figure Number and Size Number.

FIRE PROTECTION SPECIALTIES

Swinging Hose Racks

W. & C. Swinging Hose Rack,
With Wall Bracket—Fig. No. 94
With Pipe Clamps—Fig. No. 94A

CAPACITY W. & C. HOSE RACKS—Fig. Nos. 94, 94-A

Size Number	Size of Hose, Inches	Capacity, Unlined Linen Hose	Capacity, Cotton Rubber Lined Hose
0A	1¼ or 1½	50 feet	.....
0	2	50 feet	.....
00	2½	50 feet	.....
1	1¼, 1½ or 2	100 feet	.....
2	2½	100 feet	.....
3	1¼, 1½ or 2	150 feet	50 feet
4	2½	150 feet	50 feet
5	1¼, 1½ or 2	.....	100 feet
6	2½	.....	100 feet

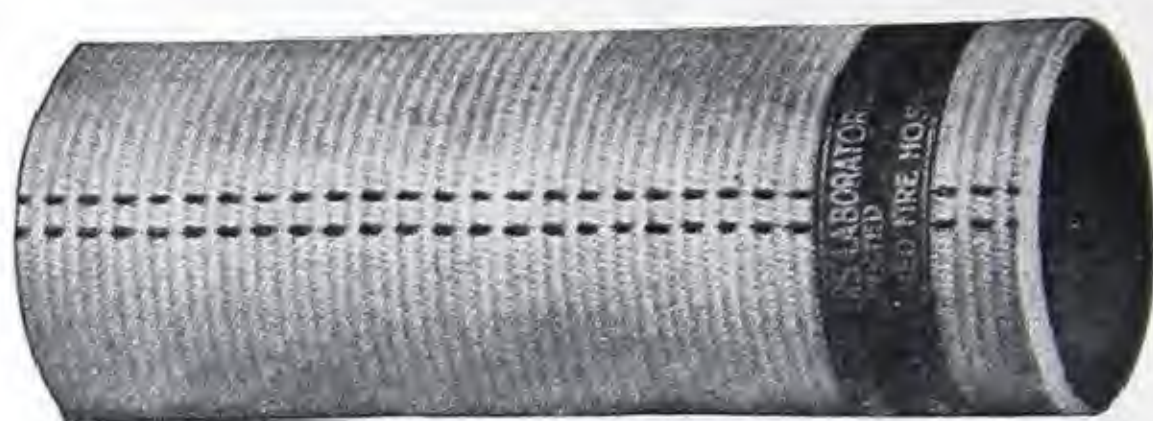
The W. & C. Swinging Hose Racks will be furnished with Wall Brackets unless otherwise specified. Can be furnished with Pipe Clamps up to 3½ inches when so ordered without additional charge. Larger sizes of pipe clamps, extra.

Racks finished in Aluminum Bronze.

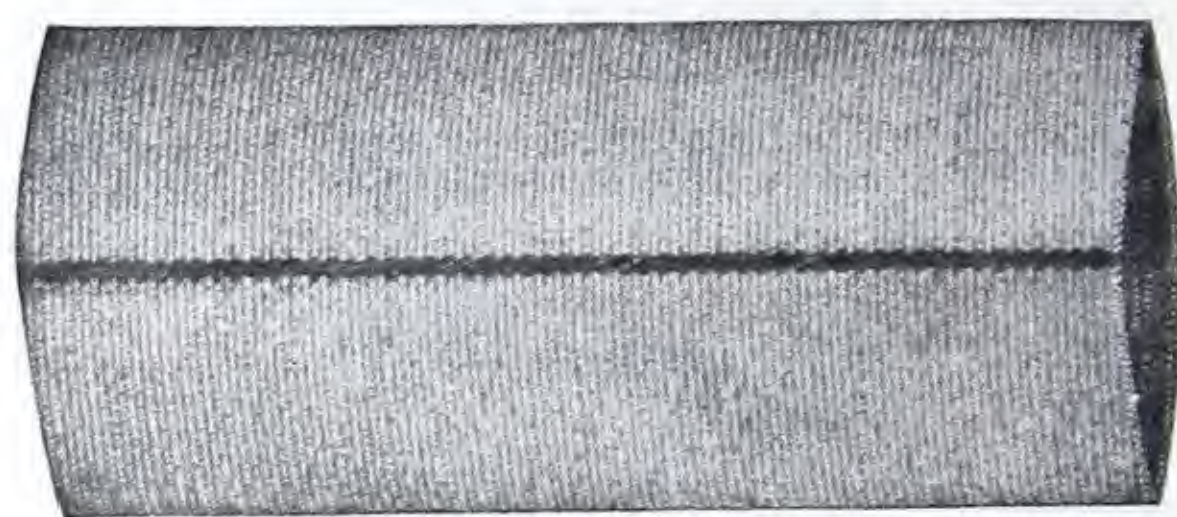
Prices furnished on application.

Order by Figure Number and Size Number.

FIRE PROTECTION SPECIALTIES

Hose

Underwriters' C. R. L. Hose



Unlined Linen Hose

We can furnish Underwriters' Cotton Rubber Lined Hose, $2\frac{5}{8}$ -inches, to meet the specifications of the Associated Factory Mutual Fire Insurance Companies or $2\frac{1}{2}$ -inches (labeled), to meet the specifications of the National Board of Fire Underwriters.

Also Unlined Linen Hose and Flax-Tow Unlined Linen Hose in sizes 1, $1\frac{1}{4}$, $1\frac{1}{2}$, 2 and $2\frac{1}{2}$ inches to meet the specifications of the Insurance Companies mentioned.

Cotton Rubber Lined Hose is regularly furnished in fifty foot lengths, coupled. Unlined Linen Hose can be furnished in twenty-five, fifty, seventy-five or one-hundred-foot lengths, coupled.

When ordering Cotton Rubber Lined Hose for fire service always specify the Insurance Company having jurisdiction.

When ordering please send sample of hose thread to be used.

In addition to the above types of fire hose we can furnish on order practically any kind of hose for other than fire service such as Single or Double Jacket Mill Hose, Suction and Chemical Hose, Steam, Air and Garden Hose, etc.

FIRE PROTECTION SPECIALTIES

*Hose Clamps**Heavy Wrought Brass*

Fig. No. 1347

Being made of brass, will not rust.

Made in a great variety of sizes to insure proper fit for any diameter of hose.

Sizes listed are for Water Hose; sizes for Lawn and Steam Hose can also be furnished.

Inside diameter of hose clamp should be $1/32$ -inch larger than outside diameter of hose.

Vise Jaws for properly applying hose clamps can also be furnished at special net prices.

LIST PRICES

Size of Hose Inches	1	1	1	$1\frac{1}{4}$
Number of Ply	2	3	4	3
Inside Diameter, Open Inches	$1\frac{11}{32}$	$1\frac{7}{16}$	$1\frac{17}{32}$	$1\frac{21}{32}$
List Price Per Doz.	\$2.00	2.00	2.00	2.50
Size of Hose Inches	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{1}{2}$	2
Number of Ply	4	3	4	3-4
Inside Diameter, Open Inches	$1\frac{13}{16}$	$1\frac{15}{16}$	$2\frac{1}{16}$	$2\frac{9}{16}$
List Price Per Doz.	\$2.50	3.00	3.00	4.00
Size of Hose Inches	$2\frac{1}{4}$	$2\frac{1}{2}$	3	
Number of Ply	3-4	3-4	3-4	
Inside Diameter, Open Inches	$2\frac{7}{8}$	$3\frac{1}{16}$	$3\frac{15}{16}$	
List Price Per Doz.	\$6.50	7.00	10.00	

Order by Figure Number.

FIRE PROTECTION SPECIALTIES

Hose Couplings



Fig. No. 1348

Hose Coupling, 1/2 to 1" Sizes



Hose Coupling, 1 1/4 to 4" Sizes

LIST PRICES—Fig. No. 1348

Size of Hose.....Inches	1/2	3/4	1	1 1/4
List Price.....Per Doz.	\$2.40	2.40	4.40	10.00
Size of Hose.....Inches	1 1/2	2	2 1/2	3
List Price.....Per Doz.	\$14.00	24.00	48.00	76.00

Hose Nipples



Hose Nipples—Fig. No. 1349

LIST PRICES—Fig. No. 1349

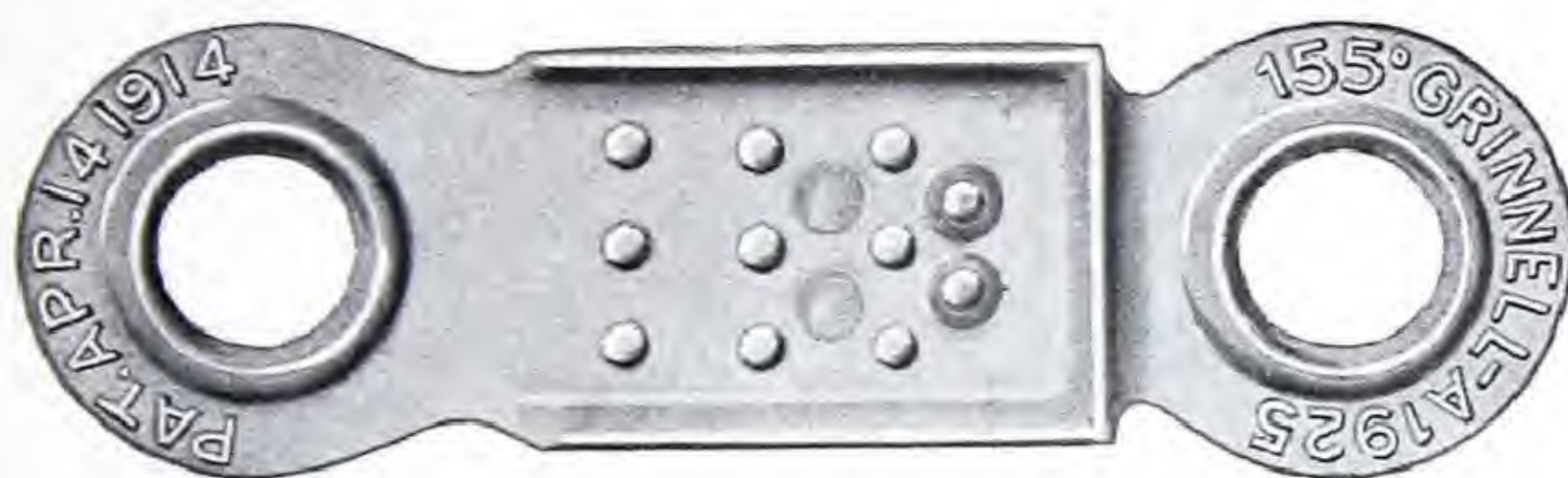
Size.....Inches	1/2	3/4	1	1 1/4	1 1/2
List Price.....Per Doz.	\$3.50	3.50	5.00	9.00	10.00
Size.....Inches	2	2 1/2	3	3 1/2	4
List Price.....Per Doz.	\$14.00	28.00	40.00	50.00	75.00

Order by Figure Number.

FIRE PROTECTION SPECIALTIES

Grinnell Fusible Links

Type B.—Fig. No. 1352



Type A.—Fig. No. 1351

The illustrations above show the two types of Grinnell Fusible Links (actual size). They are listed as Standard by the Underwriters' Laboratories and may be obtained at the following fusing temperatures, Fahrenheit:—155°, 212°, 286° and 360°.

Type A Link, Figure No. 1351, is generally used for automatic release of fire doors, windows, etc., normally held open with counterweight and cable mechanism. Good for loads not exceeding 20 lbs.

Type B Link, Figure No. 1352, is rated as good for loads not exceeding 10 lbs. and is used for controlling small trapdoors, windows and other automatic control equipment.

The Grinnell Fusible Links are made up of three interlocking phosphor bronze plates. All surfaces are covered with solder when the links are made up. The design is such that the soldered areas are so stiffened that any weakening of this portion of the link due to twisting or bending is practically eliminated. Such a feature is distinctive and characteristic of Grinnell Fusible Links.

LIST PRICES

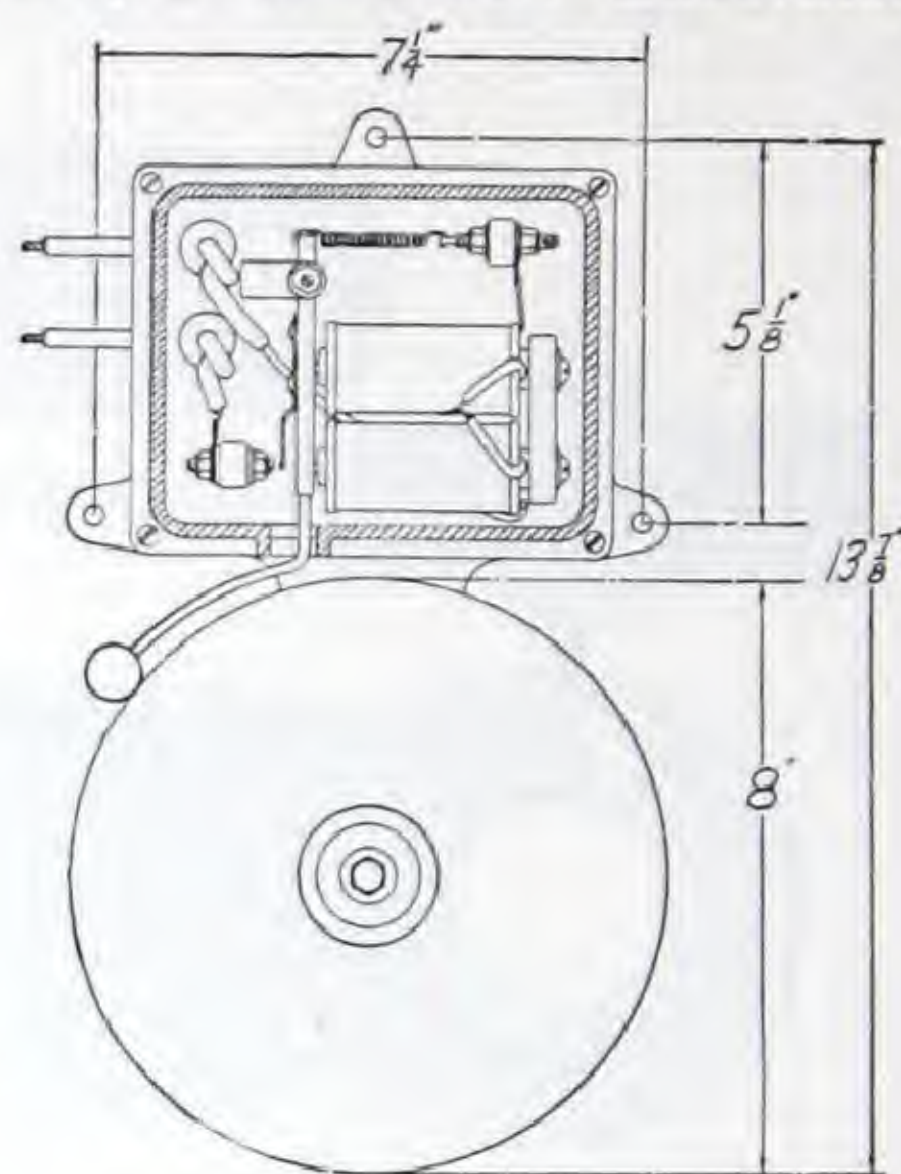
Type A, Fig. No. 1351.....	Each	\$0.60
Type B, Fig. No. 1352.....	Each	.60

Order by Figure Number.

FIRE PROTECTION SPECIALTIES

Grinnell Electric Bells

For 6 Volts Direct Current—Listed by Underwriters' Laboratories



Grinnell Electric Bell—Fig. No. 1353

LIST PRICES

Grinnell Electric Bell	Each	\$10.50
Four-Cell Dry Battery complete in Steel Box	Each	13.00
Six-Cell Dry Battery complete in Steel Box	Each	18.00
250 feet wire, porcelain cleats, Leather washers and nails		6.50

This bell is especially designed for signal service in connection with sprinkler systems, although it will be found equally serviceable wherever a well constructed moisture proof bell is needed. Bell operates on six volts, direct current.

The contact points are pure platinum, the armature and magnet cores are soft steel, while the springs and adjusting screws are phosphor bronze. The armature is copper plated and vibrates on hardened steel pivots held between adjustable phosphor bronze sockets. Mica is used for insulation wherever the shrinking of fibre or other similar material would jeopardize adjustment. All supporting posts and brackets are cast integral with the base, thus eliminating the possibility of jarring loose. The magnets have been carefully designed and constructed so that only a small amount of current is needed to ring the bell.

The gong is pressed steel, dull black finish while cast iron parts are finished in baked black enamel. Three projecting lugs on the base provide easy means for fastening in place without the necessity of removing the cover.

We can furnish electric bells on order for use with bell ringing transformers on alternating current.

We can furnish steel battery boxes, black enamel finish, with either four or six-cell No. 6 dry batteries. Covers of boxes are drilled ready for attachment of Grinnell Electric Bells.

Order by Figure Number.

FIRE PROTECTION SPECIALTIES

*Grinnell Sight Drips**Grinnell Sight Test Connections*

Sight Drip
Fig. No. 1354



Sight Test Connection
Fig. No. 1355

The Grinnell Sight Drip, Fig. No. 1354, is designed for and used extensively in the draw-off or drain pipe from sprinkler systems where such pipe connects with a sewer or drain pipe. Ends are cast iron and all metal parts are copper-plated, except the companion flanges. Made in 2-inch size only.

If the glass is dipped in kerosene just before being placed in the pipe line, it will keep clean much longer.

The Grinnell Sight Test Connection, Fig. No. 1355, is designed for use in the $\frac{3}{4}$ -inch test pipe from sprinkler systems where the test pipe connects with a sewer or drain pipe.

It is cast iron with bronze union end and nickel plated all over. Tapped for $\frac{3}{4}$ -inch pipe connections. Bronze bushings in either end have a $\frac{1}{2}$ -inch smooth bore.

LIST PRICES

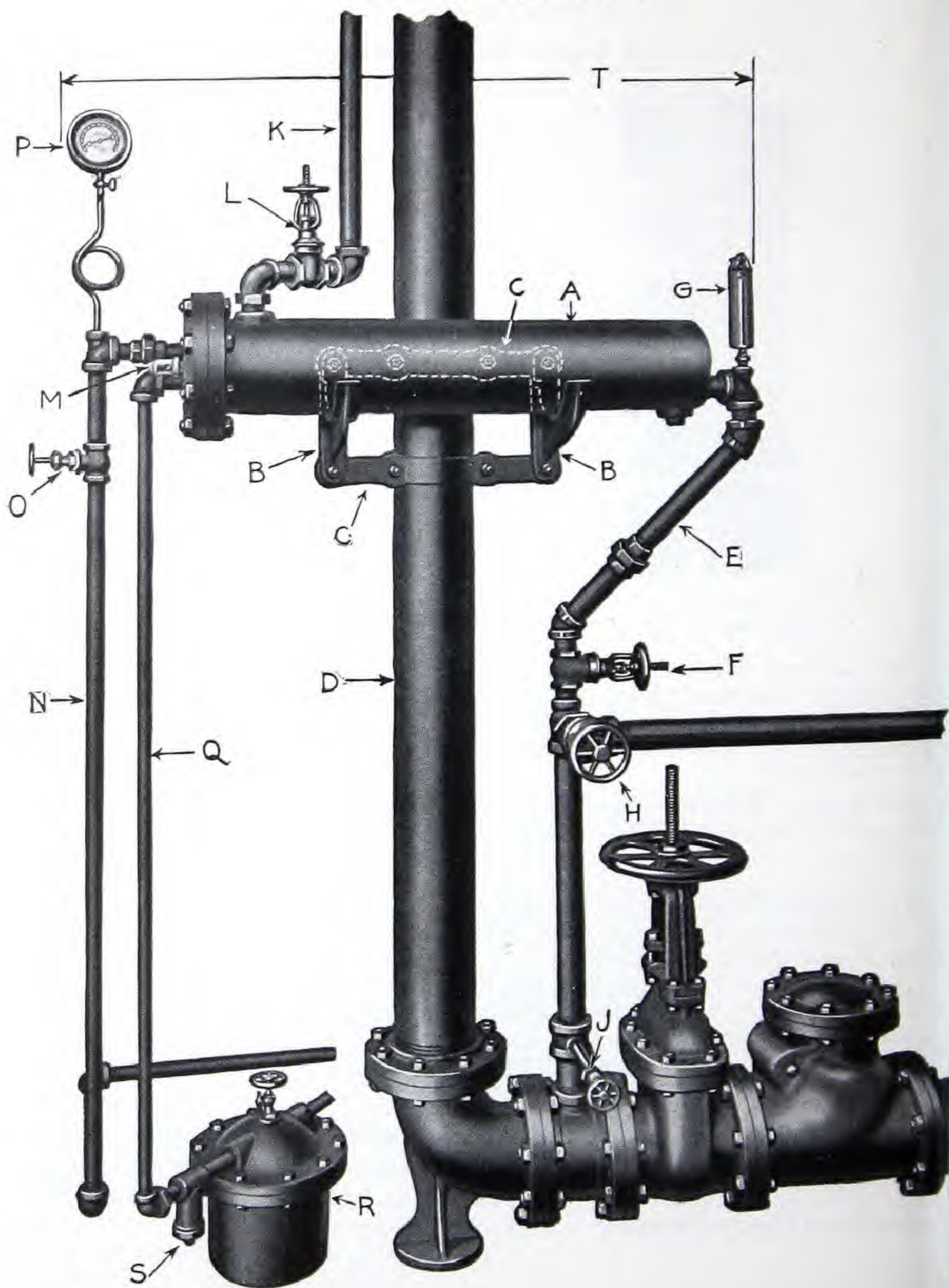
Sight Drip, Fig. No. 1354, 2-inch pipe thread	Each	\$12.00
Sight Test Connection, Fig. No. 1355, $\frac{3}{4}$ -inch pipe thread	Each	7.00
End to End, Sight Drip	Inches	$12\frac{5}{8}$
End to End, Sight Test Connection	Inches	$5\frac{1}{2}$

Order by Figure Number.

FIRE PROTECTION SPECIALTIES

Grinnell Tank Heaters

Heater only—Fig. No. 1356



FIRE PROTECTION SPECIALTIES

Grinnell Tank Heaters

Detailed Description of Parts and Connections

Letters in the following description refer to illustration on opposite page.

"A" is the Tank Heater consisting of a cast iron shell and head with internal coil of brass pipe.

"BB" are brackets which support the Tank Heater. They may be attached to the wall or frame of the building, or, by means of two Cross Bars "C" and two yokes, to the Tank Riser "D."

"E" is the Return Pipe connection from the Tank Riser to the inlet of the Tank Heater with Valve "F" and a Thermometer "G." Thermometer indicates the temperature of the coldest water in the gravity tank and Riser "D."

"H" is the Draw-off for the Tank and Tank Riser.

"J" is a $\frac{1}{2}$ " Draw-off Valve for draining water from the lower section of the Tank Riser "D."

"K" is the Flow Pipe connection from the Tank Heater to the Tank with Valve "L." The Flow Pipe should be extended up into the Tank for about one-half its depth, and a full sized tee placed on the upper end with the pipe screwed into the outlet of the tee, and the pipe properly braced; or a reducing cross with full sized outlets placed on upper end of pipe. If a cross is used a $\frac{3}{4}$ " pipe should extend from the top outlet of cross to the top of tank, at which point it should be properly secured; this serves as a means of bracing or stabilizing the flow pipe inside tank.

The section of Flow Pipe inside the Tank should be galvanized or brass. A brass expansion joint with 6" traverse should be installed in this line just below the bottom of Tank. Pipe "K" should be clamped rigidly to Tank Riser "D" close to Tank Heater "A" and loosely every 20 feet above this point.

"M" is a 1" Relief Valve set at 100 pounds, and installed in the head of the Grinnell Tank Heater, so that if the flow and return valves should be closed, when the steam is turned on to the heater, any excess pressure due to the expansion of the water will be relieved.

"N" is the Steam Supply Connection to the Coil in the Tank Heater with a Controlling Globe Valve "O" and a Pressure Gauge "P."

"Q" is the Steam Return Connection from the Coil in the Tank Heater to the Grinnell Steam Trap "R" with a Sediment Strainer "S."

Notes:

Valves "F" and "L" should be O. S. & Y. Gate Valves as shown in illustration, for all Insurance Companies except the Factory Insurance Association who require these Valves to be L. R. D. Angle Valves.

See following pages for List Prices, also tables giving Capacities, Pipe Sizes and List of Materials.

For further information regarding installation, write for our Bulletin No. 3, Tank Heaters.

FIRE PROTECTION SPECIALTIES

Grinnell Tank Heaters

List of Materials in Boxes of Connections

DESCRIPTION	HEATERS							
	No. 1		No. 2		No. 3		No. 4	
	Quan.	Size	Quan.	Size	Quan.	Size	Quan.	Size
C. I. Angle Elbows 45°	2	2"	2	2"	2	2"	2	2"
C. I. Elbow	1	3/4"	2	1"	1	1 1/4"	2	1 1/4"
C. I. Elbow	1	2"	1	2"	1	2"	1	2"
C. I. Reducing Elbow	1	1" x 3/4"			1	1 1/4" x 1"		
Face Bushing							2	1 1/2" x 1 1/4"
C. I. Reducing Tee	1	2" x 1 1/2" x 2"	1	2" x 1 1/2" x 2"	1	2" x 1 1/2" x 2"	1	2" x 1 1/2" x 2"
C. I. Reducing Tee	1	1 1/4" x 1 1/4" x 1"	1	1 1/2" x 1 1/4" x 1"	1	2" x 1 1/4" x 1"	1	2" x 1 1/4" x 1 1/4"
Mall. Union Elbow —M. & F.	1	3/4"	1	1"	1	1 1/4"	1	1 1/4"
Mall. Union Elbow —M. & F.	1	2"	1	2"	1	2"	1	2"
Star Union	1	2"	1	2"	1	2"	1	2"
Star Union	1	3/4"	2	1"	1	1"	2	1 1/4"
Star Union	1	1"			1	1 1/4"		
Iron Pipe Siphon	1	1/4"	1	1/4"	1	1/4"	1	1/4"
H. W. Thermometer Str. 30°-240°	1	1/2"	1	1/2"	1	1/2"	1	1/2"
Lunk. Relief Valve Fig. No. 100-100lb	1	1"	1	1"	1	1"	1	1"
Grinnell Sediment Strainer	1	No. 2	1	No. 3	1	No. 4	1	No. 4
Grinnell Globe Valve	1	1 1/4"	1	1 1/2"	1	2"	1	2"
Kennedy O. S. & Y. Valve, Fig. No. 66.	2	2"	2	2"	2	2"	2	2"
I. B. N. P. Rim Pressure Gauge	1	3 1/2"-60lb	1	3 1/2"-60lb	1	3 1/2"-60lb	1	3 1/2"-60 lb
Gauge Cock	1	1/4"	1	1/4"	1	1/4"	1	1/4"
Heater Brackets	2	No. 1-2	2	No. 1-2	2	No. 3	2	No. 4

The tables, on this and the following page, giving Capacities, List of Materials and List Prices are based on a 10 pound steam pressure at the Heater. For other pressures corresponding adjustments and allowances should be made when considering the size or number of Heaters and when ordering trimmings, especially the Steam Trap and Steam Gauge.

Grinnell Steam Traps are crated separately and the sizes used with Tank Heaters are as follows:

Size of Heater	No. 1	No. 2	No. 3	No. 4
Size of Trap—25 lb	No. 2	No. 3	No. 4	No. 5

LIST PRICES

Size of Heater	No. 1	No. 2	No. 3	No. 4
Tank Heater Fig. No. 1356	\$50.00	\$60.00	\$110.00	\$175.00
Steam Trap—25 lb Fig. No. 1403	30.00	40.00	60.00	100.00
Box of Connections	80.00	80.00	85.00	90.00
TOTAL	\$160.00	\$180.00	\$255.00	\$365.00

When the Tank Heater is to be supported on the tank riser, 2 cross bars, 2 yokes and 4 bolts and nuts, 1/2 x 2 1/4, will be furnished at the following prices:

Size of Riser	6"	8"	10"
List Price for Set	\$3.85	\$4.00	\$5.30

All pipe and nipples needed should be ordered separately, together with connections to tank riser and to tank, including brass expansion joint.

FIRE PROTECTION SPECIALTIES

Grinnell Tank Heaters

Sizes—Capacities—Etc.

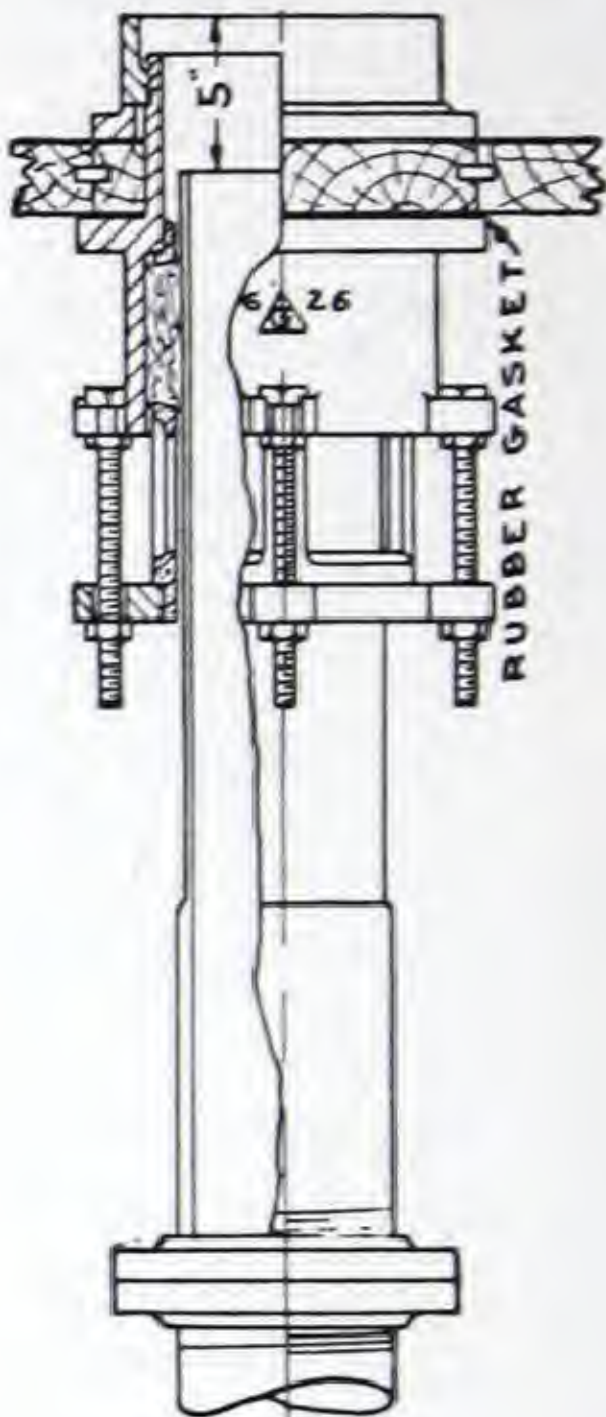
The following data relative to sizes, capacities, etc. is our regular practice and is satisfactory. However, Insurance Inspection Department having jurisdiction should be consulted so that there will be no confliction with special rules they might have.

Cap. Elev. Tank in Gals.	Min. One Day Aver. Temp.	Grinnell Tank Heaters required to maintain +40°F in Tank with 10lb Steam Pressure	Steam Supply	Steam Return	Water Flow and Return	Cap. Elev. Tank in Gals.	Min. One Day Aver. Temp.	Grinnell Tank Heaters required to maintain +40°F in Tank with 10lb Steam Pressure	Steam Supply	Steam Return	Water Flow and Return
Wood	0°	1 No. 1 Heater	1 1/4	3/4	2	Steel	0°	1 No. 3 Heater	2	1 1/4	2
20,000	-10°						-10°	1 No. 4			
	-20°	1 No. 2	1 1/2	1	2	30,000	-20°	1 No. 2-1 No. 3	2 1/2	1 1/2	2 1/2
	-30°						-30°	2 No. 3			
Wood	0°	1 No. 1	1 1/4	3/4	2	Steel	0°	1 No. 4	2	1 1/4	2
25,000	-10°	1 No. 2	1 1/2	1	2		-10°	1 No. 2-1 No. 3			
	-20°					40,000	-20°	2 No. 3	2 1/2	1 1/2	2 1/2
	-30°	1 No. 3	2	1 1/4	2		-30°	1 No. 3-1 No. 4			
Wood	0°	1 No. 1	1 1/4	3/4	2	Steel	0°	1 No. 4	2	1 1/4	2
30,000	-10°	1 No. 2	1 1/2	1	2		-10°	2 No. 3			
	-20°					50,000	-20°	1 No. 3-1 No. 4	2 1/2	1 1/2	2 1/2
	-30°	1 No. 3	2	1 1/4	2		-30°	2 No. 4			
Wood	0°	1 No. 2	1 1/2	1	2	Steel	0°	1 No. 2-1 No. 3			
40,000	-10°						-10°	2 No. 3			
	-20°	1 No. 3	2	1 1/4	2	60,000	-20°	1 No. 3-1 No. 4	2 1/2	1 1/2	2 1/2
	-30°						-30°	3 No. 3			
Wood	0°	1 No. 2	1 1/2	1	2	Steel	0°	2 No. 3			
50,000	-10°						-10°	1 No. 3-1 No. 4	2 1/2	1 1/2	2 1/2
	-20°	1 No. 3	2	1 1/4	2	75,000	-20°	2 No. 4			
	-30°						-30°	2 No. 3-1 No. 4			
Wood	0°	1 No. 3	2	1 1/4	2	Steel	0°	2 No. 3			
60,000	-10°						-10°	2 No. 4			
	-20°					90,000	-20°	2 No. 3-1 No. 4	2 1/2	1 1/2	2 1/2
	-30°						-30°	3 No. 4			
Wood	0°	1 No. 3	2	1 1/4	2	Steel	0°	2 No. 3			
75,000	-10°						-10°	2 No. 4			
	-20°	1 No. 4	2	1 1/4	2	100,000	-20°	2 No. 3-1 No. 4	2 1/2	1 1/2	2 1/2
	-30°						-30°	3 No. 4			
Steel	0°	1 No. 3	2	1 1/4	2	Steel	0°	2 No. 4			
20,000	-10°						-10°	2 No. 3-1 No. 4	2 1/2	1 1/2	2 1/2
	-20°	1 No. 4	2	1 1/4	2	125,000	-20°	3 No. 4			
	-30°	1 No. 2-1 No. 3	2 1/2	1 1/2	2 1/2		-30°	2 No. 3-2 No. 4	3	2	2 1/2
Steel	0°	1 No. 3	2	1 1/4	2	Steel	0°	2 No. 4			
25,000	-10°						-10°	1 No. 3-2 No. 4	2 1/2	1 1/2	2 1/2
	-20°	1 No. 4	2	1 1/4	2	150,000	-20°	2 No. 3-2 No. 4	3	2	2 1/2
	-30°	2 No. 3	2 1/2	1 1/2	2 1/2		-30°	4 No. 4			

FIRE PROTECTION SPECIALTIES
Grinnell Combination Tank Connections and
Expansion Joints



Fig. No. 1357



Application

The Grinnell Combination Tank Connection is made in accordance with the specifications of the Associated Factory Mutual Fire Insurance Companies and approved by them. It is designed to take care of the settling of wooden tanks or tank structures, also expansion and contraction.

The body, slip flange and coupling are cast iron. The sliding parts consist of a steel pipe 36" long, turned and galvanized, sliding within a brass bushing and brass stuffing box. A heavy rubber gasket is used between body flange and tank bottom. The slip flange and coupling provide a sediment basin 4-inches deep as required by the Insurance Companies.

The upper end of sleeve should be set about 5-inches below top of coupling to allow for settlement. Lower end of sleeve is threaded ready for coupling or flange.

LIST PRICES

Size.....Inches	6	8	10
Price.....Each	\$100.00	\$125.00	\$150.00
Underside Tank } Maximum.....Inches	36 ⁵ / ₁₆	36 ⁷ / ₁₆	36 ⁹ / ₁₆
Bottom to Lower } Minimum, 2 ¹ / ₄ " Bottom Inches	29 ³ / ₄	29 ³ / ₄	29 ³ / ₄
End of Sleeve } Minimum, 2 ³ / ₄ " Bottom Inches	29 ¹ / ₄	29 ¹ / ₄	29 ¹ / ₄

Order by Figure Number.

FIRE PROTECTION SPECIALTIES

Grinnell Mercury Gauges for Gravity Tanks

The Grinnell Mercury Gauge is an accurate and convenient appliance for indicating the amount or depth of water in gravity tanks. Simple in construction, having no moving parts to get out of order, it is the most reliable device for such purposes.

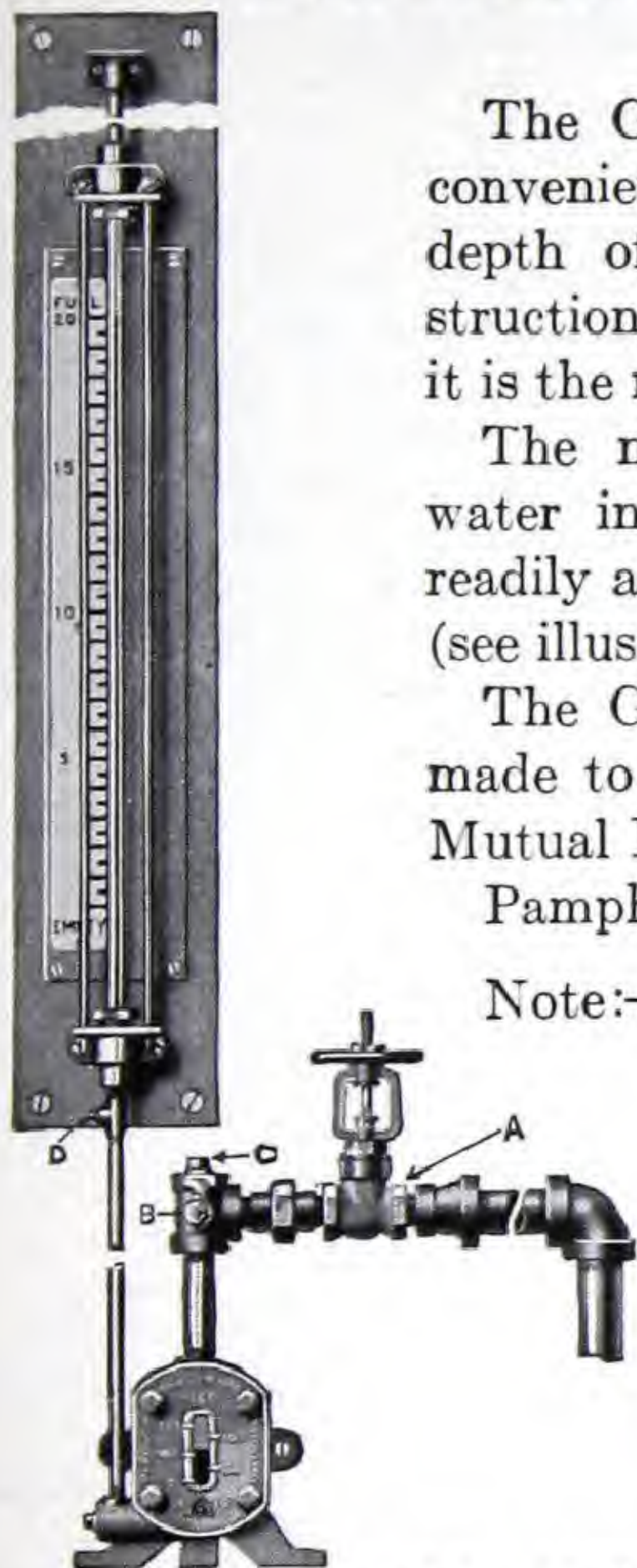
The mercury column indicates the level of the water in the gravity tank and such level can be readily ascertained by referring to the graduated scale (see illustration).

The Grinnell Mercury Gauge is approved by and made to the specifications of the Associated Factory Mutual Fire Insurance Companies.

Pamphlet descriptive of this gauge sent on request.

Note:—A Mercury Catcher is not a standard part of the equipment, but is sometimes necessary on account of high filling pressure or water hammer. Mercury Catcher will be furnished when ordered at an extra price.

The weight of mercury needed with different heights of full water level above the centre of the Mercury pot is as follows:



Mercury Gauge—Fig. No. 1358

Head of Water in feet	25	50	75	100	125	150	175	200
Weight of Mercury in pounds . . .	2½	3	3¾	4½	5¼	6	6¾	7½
Price, Mercury Gauge, not including Mercury	Each \$50.00							

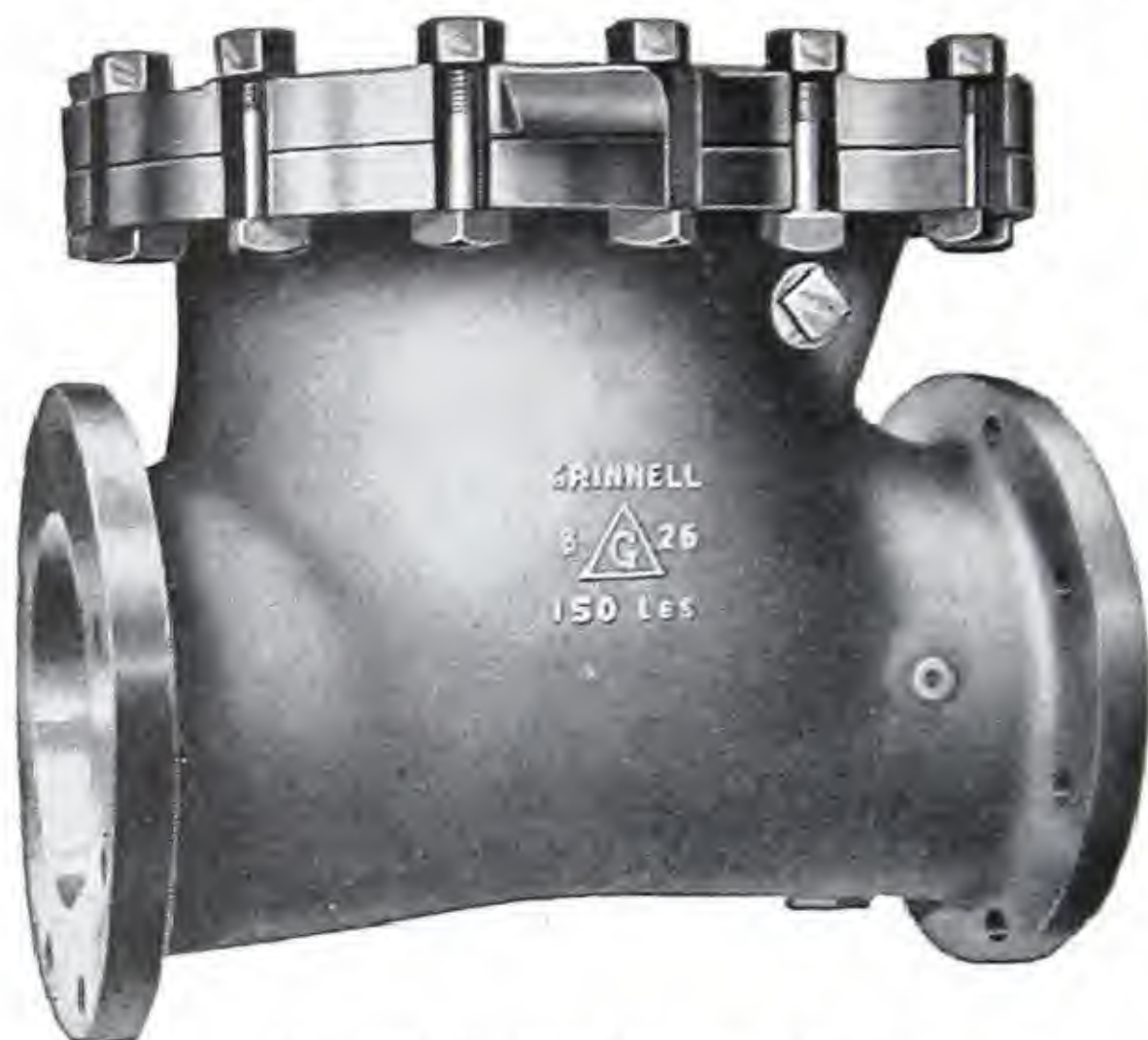
The above price includes the following items: One box containing Mercury Pot, Glass Mercury Gauge, one ⅛-inch T. H. Air Cock, one ½-inch O. S. & Y. Gate Valve, one ½-inch Union, one ½-inch C. I. Tee ⅛-inch S. O., one ½-inch Plug, one 1" x ½" C. I. Red. Coupling, one 1-inch C. I. Ell, three ½-inch Close Nipples, one ⅛-inch Mal. Tee, one ⅛-inch Close Nipple, one ⅛-inch Mal. Plug.

Note:—Glass Gauge is shipped mounted on board together with ⅛-inch pipe 24-inches long and elbow with ⅛-inch vent.

When ordering, specify depth of tank in feet and inches from full water level to top of discharge connection on flat bottom wood or steel tanks, or to bottom of straight cylindrical portion of curved bottom steel tanks; also height of the full water level above the center of the Mercury Pot. State whether mercury should be furnished.

Order by Figure Number.

FIRE PROTECTION SPECIALTIES

*Grinnell Special Type F. M. Check Valves
and Connections for Special Fire Service*

Special F. M. Check Valve
Fig. No. 1359

Grinnell Special Type F.M. Check Valves are made to the specifications of the Associated Factory Mutual Fire Insurance Companies. They are designed to be used in pairs in the public water service pipes to private fire systems to prevent water from a secondary source from backing up into the public mains.

NORMAL CONDITION OF VALVES

OPEN
Gate Valves W-X

SHUT
Test Valves ($\frac{3}{4}$ -inch) R-S

About once a year inspect check valves including internal parts and thoroughly clean seats, clapper faces and whole interior.

To facilitate removing check valve covers, pack with $\frac{1}{8}$ -inch sheet rubber packing faced with machine oil and graphite, and grease bolts with heavy oil and graphite.

METHOD OF TESTING

Open test valve S to blow out any sediment that may have accumulated in test valve or connecting pipe and then close.

Close valve W and open test valve S. If pressure falls at gauge N and pressure at gauge M holds after decreasing slightly, check valve K is tight.

While test valve S remains open and pressure at gauge N stands at zero, open test valve R. If pressure at gauge M falls to zero and flow from test valve R ceases, check valve J is tight.

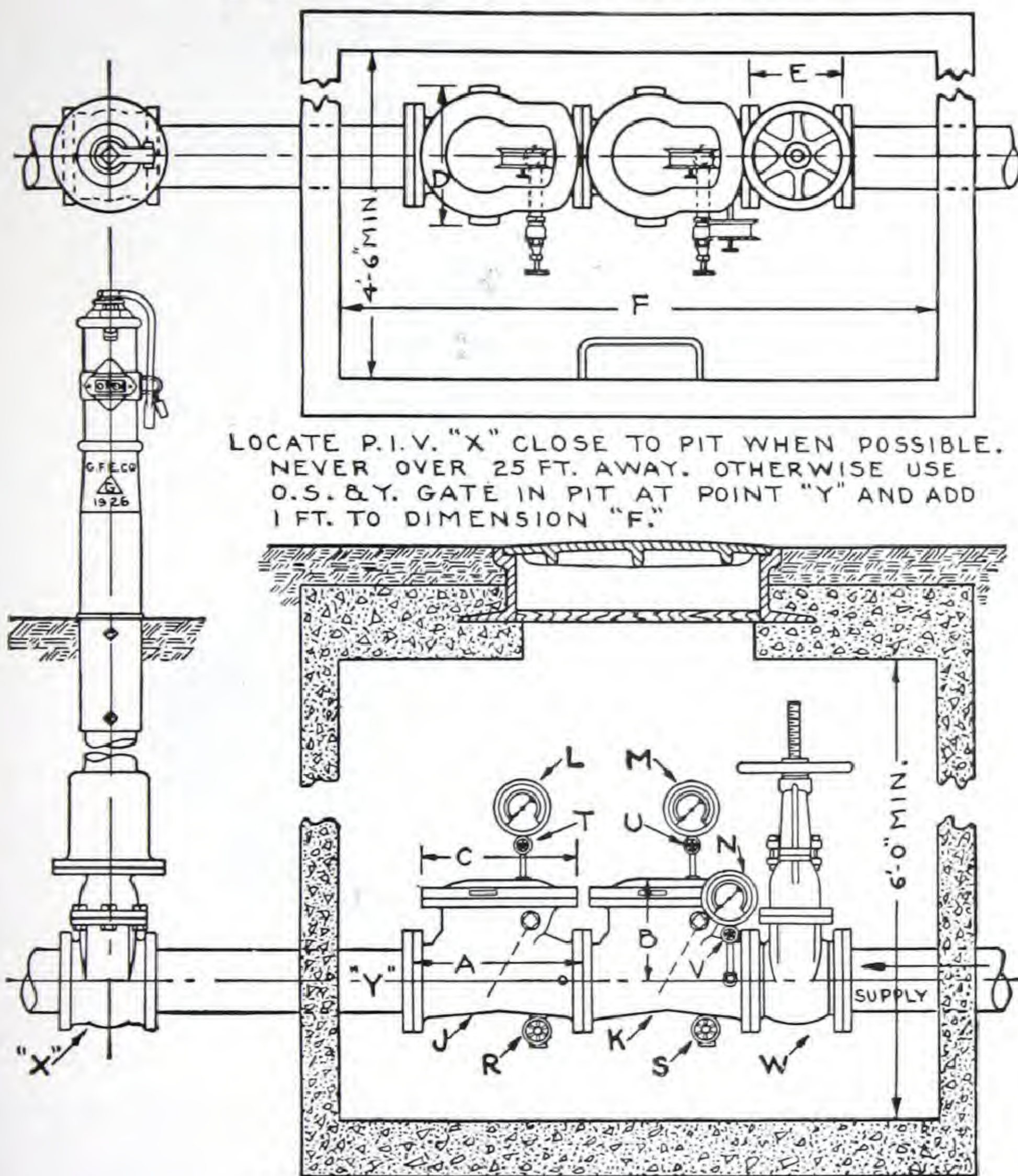
CAUTION:—Immediately at close of test see that valves W and X are open and that valves R and S are closed. It is important that the protection be promptly restored.

LIST OF TRIMMINGS

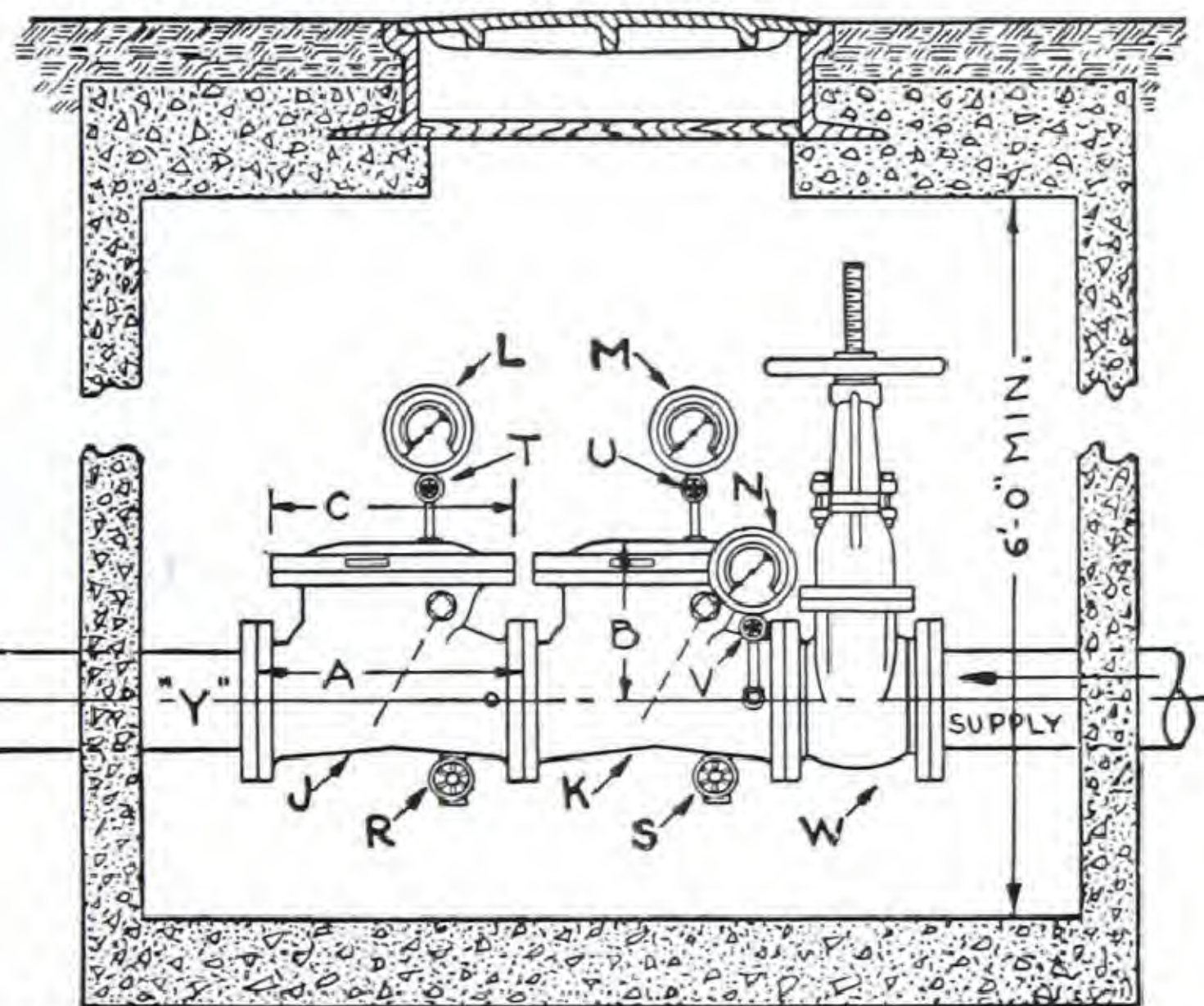
3- Pressure Gauges, 250 lbs. for water	1- $\frac{1}{4}$ " C. I. Elbow	2- $\frac{3}{4}$ x Close Steel Nipples
3- $\frac{1}{4}$ " S. O. Globe Valves	2- $\frac{3}{4}$ " C. I. Elbows	3- $\frac{1}{4}$ x 3 Steel Nipples
2- $\frac{3}{4}$ " L.R.D. Angle Valves	4- $\frac{1}{4}$ " C. I. Plugs	1- $\frac{1}{4}$ x 4 Steel Nipples
	2- $\frac{3}{4}$ x 6 Steel Nipples	

Order trimmings in detail as per above list; also bolts, nuts, gaskets, etc.
Order by Figure Number.

FIRE PROTECTION SPECIALTIES
Grinnell Special Type F. M. Check Valves
 LIST PRICES AND DIMENSIONS



LOCATE P.I.V. "X" CLOSE TO PIT WHEN POSSIBLE.
 NEVER OVER 25 FT. AWAY. OTHERWISE USE
 O.S. & Y. GATE IN PIT AT POINT "Y" AND ADD
 1 FT. TO DIMENSION "F."



P.I.V. CANNOT BE SUBSTITUTED FOR VALVE - W

Pipe Size Inches	List Price Each Valve	A	B	C	D	E	F-Min.
6	\$100.00	18	11 $\frac{3}{8}$	16 $\frac{11}{16}$	15 $\frac{1}{2}$	10 $\frac{1}{8}$	5'-0"
8	140.00	21 $\frac{1}{2}$	13 $\frac{5}{8}$	20 $\frac{9}{16}$	18 $\frac{3}{4}$	11 $\frac{1}{4}$	6'-0"
10	200.00	25	15 $\frac{7}{8}$	23 $\frac{15}{16}$	21 $\frac{1}{2}$	12 $\frac{5}{8}$	7'-0"

Price, Set of Trimmings (as listed on opposite page) \$35.00.
 Order by Figure Number.

FIRE PROTECTION SPECIALTIES

*Grinnell Detector Checks**With Meters in By-Pass*

Grinnell Detector Check
Fig. No. 1360

The Grinnell Detector Check with meter in by-pass is a "detector" device to guard against leakage or possible misuse of water in fire protection equipments. It has been approved by the Associated Factory Mutual Fire Insurance Companies for this purpose and has met the approval of other insurance interests wherever submitted, also many water works officials.

The Detector Check with 2-inch by-pass and meter accurately measures water flows up to thirty gallons per minute, which is sufficient to indicate leakage or any misuse of water for other than fire extinguishment. With a 1½-inch meter and by-pass, the flow is accurately measured up to about sixteen gallons per minute.

Unless otherwise specified, the Detector Check will be tapped for 2-inch right hand by-pass as illustrated.

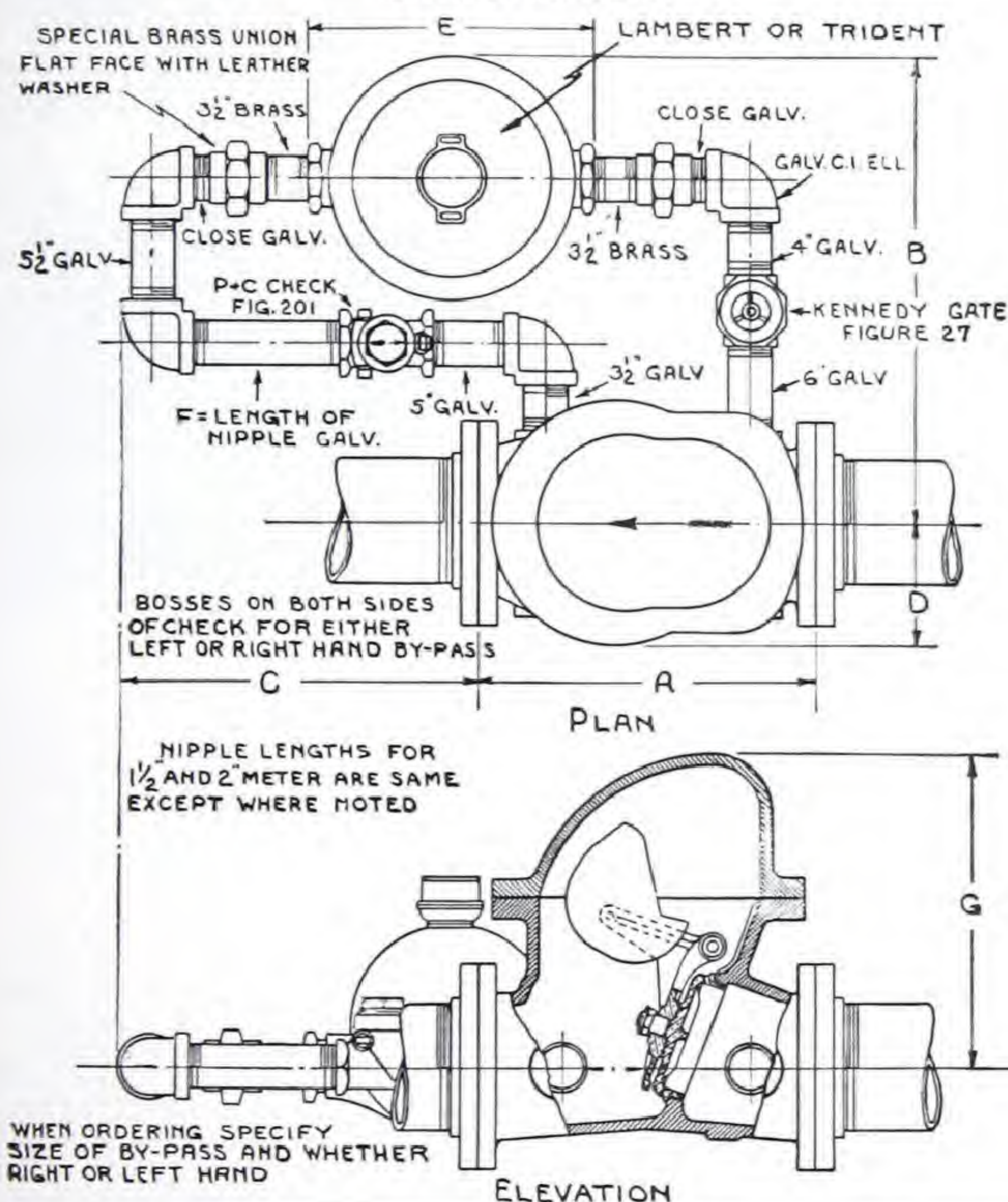
FIRE PROTECTION SPECIALTIES

Grinnell Detector Checks

LIST PRICES

4-inch Detector Check, only.....	\$100.00
6-inch Detector Check, only.....	130.00
8-inch Detector Check, only.....	210.00
2-inch By-Pass (Not assembled—Not including Meter).....	38.00
1½-inch By-Pass (Not assembled—Not including Meter).....	30.00

DIMENSIONS



Size Inches	By-Pass Inches	A	B	C	D	E	F	G
4	1½	14⅝	22	18½	5⅞	12⅝	10	13¼
	2	14⅝	24	22¼	5⅞	15¼	12	13¼
6	1½	18	23	15⅝	6⅝	12⅝	6¾	16¾
	2	18	25	19	6⅝	15¼	8¾	16¾
8	1½	21½	24	12	8¼	12⅝	4	21¼
	2	21½	26	15¾	8¼	15¼	6	21¼

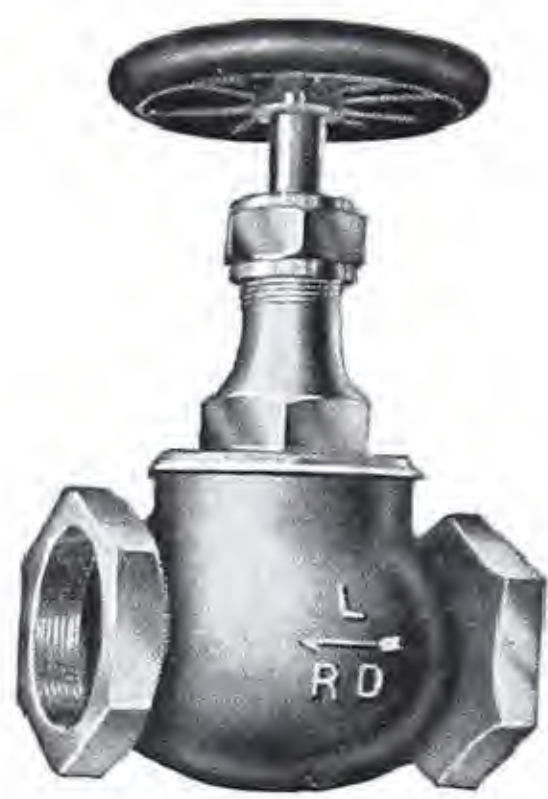
Order by Figure Number.

VALVES

Grinnell L. R. D. Globe and Angle Valves

Grinnell Side Outlet Globe Valves

For 150 Lbs. Water or Air Pressure



L. R. D. Globe Valve
Fig. No. 1361



Side Outlet Globe Valve
Fig. No. 1363



L. R. D. Angle Valve
Fig. No. 1362

LIST PRICES—L. R. D. Valves and Discs

	BRONZE BODY									Iron Body
Size.....Inches	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	2
Globe Valve.....Each	1.10	1.25	1.60	2.20	2.80	4.00	5.50	8.75	15.75	.....
Angle Valve.....Each	1.10	1.25	1.60	2.20	2.80	4.00	5.50	8.75	15.75	7.25
Discs.....Each	.20	.20	.25	.30	.40	.50	.65	1.00	2.00	1.00
Re-filling Discs.....Each	.08	.08	.10	.12	.15	.17	.25	.30	.40	.30
End to End, Globe Valve.....Inches	1 13/16	2 1/16	2 3/8	2 7/8	3 5/16	4	4 7/16	5 5/8	8	.....
Center to End, Angle Valve.....Inches	7/8	1	1 3/16	1 7/16	1 3/4	1 15/16	2 1/4	2 5/8	3 1/2	2 5/8

LIST PRICES—SIDE OUTLET GLOBE VALVE

Size.....Inches	1/4
Price (without plug for side outlet).....Each	\$1.25
End to End.....Inches	1 5/8

Grinnell L. R. D. Valves are designed for air or water service in Automatic Sprinkler and other fire protection equipments. Renewable Discs for valves in sizes 1-inch and smaller are the same for either air or water services; different discs for air and water services are used in valves 1 1/4-inch and larger.

When ordering Valves or Discs, specify whether for "Air" or "Water."

Grinnell Side Outlet Globe Valves are of the needle type and are used extensively as a gauge controlling valve in fire protection equipments, etc. The side outlet, shown plugged, is provided for attachment of the Inspector's test gauge.

The 1/4-inch plug must be ordered separately.

Order by Figure Number.

VALVES

Grinnell Check Valves

Underwriters' Approved

Regular Type F. M.—Iron Body Bronze Mounted

125 Lbs. Steam Pressure

150 Lbs. Water Pressure



Flanged—Fig. No. 1364

Flanged with By-Pass—Fig. No. 1367

Screwed (Not Ill.)—Fig. No. 1365

Bell End with By-Pass (Not Ill.)—Fig. No. 1368

Bell End (Not Ill.)—Fig. No. 1366

LIST PRICES AND DIMENSIONS

Size.....Inches	4	5	6	8	10	12
Price, Flanged.....Each	\$24.00	\$34.00	\$41.00	\$75.00	\$115.00	\$168.00
Price, Screwed.....Each	20.00	30.00	36.00	.....	.....	.....
Price, Bell Ends.....Each	27.00	.....	45.00	82.50	125.00	185.00
Face to Face, Screwed and Flanged..Inches	12 $\frac{3}{4}$	13 $\frac{1}{2}$	15 $\frac{1}{2}$	18 $\frac{1}{2}$	22	24 $\frac{1}{2}$
Face to Face, Bell Ends.....Inches	19	.....	22 $\frac{1}{2}$	25 $\frac{1}{2}$	28 $\frac{3}{4}$	31 $\frac{1}{4}$
Diameter of Flanges.....Inches	9	10	11	13 $\frac{1}{2}$	16	19
Depth of Bell.....Inches	4	4	4	4	4	4
Center to Top of Handhole Bolts....Inches	10 $\frac{5}{16}$	11 $\frac{3}{16}$	12 $\frac{1}{8}$	14 $\frac{1}{8}$	16 $\frac{7}{16}$	18 $\frac{1}{8}$
Center to Outside of By-Pass (Max) .Inches	.....	.....	12 $\frac{9}{16}$	13 $\frac{5}{16}$	15 $\frac{9}{16}$	16 $\frac{7}{16}$
Center to End of By-Pass (Max) ....Inches	.....	.....	14 $\frac{3}{4}$	16 $\frac{1}{8}$	17 $\frac{1}{4}$	17 $\frac{7}{8}$

For Iron Body Swing Check Valves with leather or rubber discs add to list price as follows: 4 inch \$3.00; 5 inch \$4.00; 6 inch \$4.00; 8 inch \$7.50; 10 inch \$10.00, and 12 inch \$12.00.

By-pass complete for 6", 8", 10" and 12" sizes, add \$20.00 to list. By-pass not furnished on 4" or 5" valves.

These valves have been designed in accordance with the specifications of the Associated Factory Mutual Fire Insurance Companies and the National Board of Fire Underwriters.

Order by Figure Number.

VALVES

Jenkins Bronze Globe and Angle Valves
Standard

150 Lbs. Steam Pressure

250 Lbs. Water Pressure



Globe, Screwed—Fig. No. 106



Angle, Screwed—Fig. No. 108



Globe, Flanged—Fig. No. 107



Angle, Flanged—Fig. No. 109

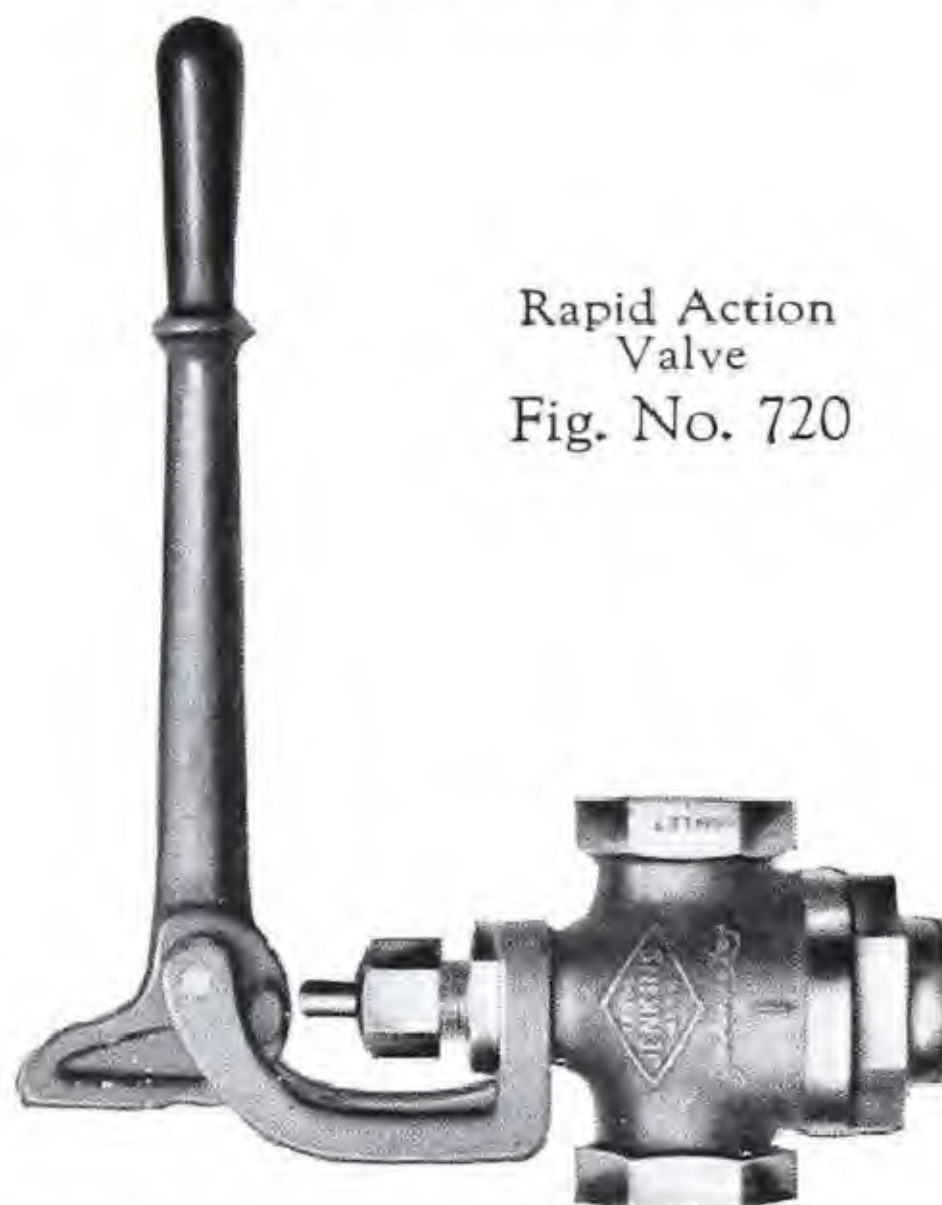
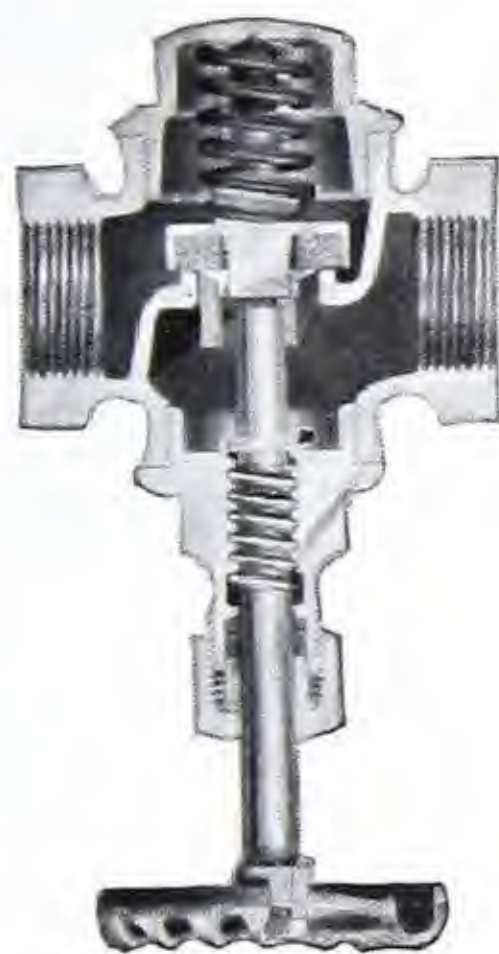
LIST PRICES—Fig. Nos. 106, 107, 108, 109

Size Inches	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1
Price, Globe or Angle, Screwed Each	1.10	1.10	1.25	1.60	2.20	2.80
Price, Globe or Angle, Flanged Each	....	3.50	4.00	4.00	5.00	6.00
End to End, Globe, Screwed Inches	$1\frac{9}{16}$	$2\frac{1}{8}$	$2\frac{3}{8}$	$2\frac{3}{4}$	$3\frac{5}{16}$	$3\frac{13}{16}$
Center to End, Angle, Screwed . . . Inches	$\frac{13}{16}$	$1\frac{1}{16}$	$1\frac{3}{16}$	$1\frac{3}{8}$	$1\frac{1}{2}$	$1\frac{3}{4}$
Face to Face, Globe, Flanged Inches	....	$2\frac{7}{16}$	3	$3\frac{1}{16}$	$3\frac{5}{8}$	4
Center to Face Angle, Flanged . . . Inches	....	$1\frac{3}{8}$	$2\frac{1}{16}$	$2\frac{1}{16}$	$2\frac{3}{8}$	$2\frac{5}{8}$
Diameter of Flanges Inches	....	$2\frac{1}{2}$	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4

Size Inches	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Price, Globe or Angle, Screwed Each	4.00	5.50	8.75	15.75	22.00
Price, Globe or Angle, Flanged Each	9.00	11.00	16.50	25.00	34.00
End to End, Globe, Screwed Inches	$4\frac{1}{4}$	$4\frac{7}{8}$	$5\frac{3}{4}$	$6\frac{5}{8}$	$8\frac{1}{2}$
Center to End, Angle, Screwed . . . Inches	$2\frac{1}{16}$	$2\frac{1}{4}$	$2\frac{7}{8}$	$3\frac{1}{4}$	$4\frac{1}{4}$
Face to Face, Globe, Flanged Inches	$4\frac{3}{8}$	$4\frac{7}{8}$	6	$6\frac{3}{4}$	$7\frac{1}{2}$
Center to Face Angle, Flanged . . . Inches	$2\frac{5}{16}$	$3\frac{3}{16}$	$3\frac{3}{4}$	$4\frac{1}{4}$	$4\frac{9}{16}$
Diameter of Flanges Inches	$4\frac{1}{2}$	5	6	7	$7\frac{1}{2}$

For List Prices on drilling, see page 340.
Order by Figure Number.

VALVES

Jenkins Selclo and Rapid Action Valves $\frac{1}{2}$ " to 2", 150 Lbs. Pressure $2\frac{1}{2}$ ", 100 Lbs. PressureSelclo Valve
Fig. No. 357Rapid Action
Valve
Fig. No. 720

LIST PRICES—Fig. No. 357

Size.....Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Price.....Each	4.85	5.35	5.85	8.15	12.00	15.60

LIST PRICES—Fig. No. 720

Size.....Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$
Price.....Each	7.00	9.00	10.00	12.00	15.00	20.00	28.00

The construction of the Selclo Valve is such that it is mechanically impossible to crush the disc or seat in opening and closing. The valves are suitable for use on either steam, air or water lines. In a horizontal line they should be installed so the handwheel is at the lowest point. Turning the handwheel to the left, the spindle will push the discholder off the seat and open the valve. Turning the handwheel to the right, releases the spindle from the discholder and the spring forces the discholder to the seat with a steady even pressure. The pressure holds the valve closed.

The Rapid Action Valve is suited for laundries, hotels, etc., where quick "on-and-off" action is desired in either hot or cold water lines. It is opened or closed quickly by a short pull on the hand lever and stays open automatically. The closing of the disc on seat is regulated to avoid water-hammer, through a combination of spring, piston, and water pressure.

When ordering either of these valves, specify the service and pressure that disc of proper composition may be furnished.

Order by Figure Number.

VALVES

*Jenkins Reliance Bronze Globe and Angle Valves**Medium Pressure—Union Bonnet—Regrinding**200 Lb. Working Steam Pressure*

Globe
Screwed—Fig. No. 425
Flanged—Fig. No. 426



Angle
Screwed—Fig. No. 427
Flanged—Fig. No. 428

LIST PRICES—Fig. Nos. 425, 426, 427, 428

Size.....Inches	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1
Price, Fig. Nos. 425 and 427.....Each	\$1.30	\$1.30	\$1.50	\$1.90	\$2.50	\$3.50
Price, Fig. Nos. 426 and 428.....Each				5.00	6.00	8.00
Fig. No. 425, End to End.....Inches	$1\frac{5}{8}$	$2\frac{1}{16}$	$2\frac{1}{8}$	$2\frac{3}{8}$	$2\frac{11}{16}$	$3\frac{3}{8}$
Fig. No. 426, Face to Face.....Inches				$3\frac{5}{8}$	$4\frac{1}{8}$	$4\frac{5}{8}$
Fig. No. 427, Centre to End.....Inches	$\frac{1}{16}$	$1\frac{1}{32}$	$1\frac{1}{16}$	$1\frac{3}{16}$	$1\frac{7}{16}$	$1\frac{11}{16}$
Fig. No. 428, Centre to Face.....Inches				2	$2\frac{1}{4}$	$2\frac{1}{2}$
Diameter of Flanges.....Inches				3	$3\frac{1}{2}$	4

Size.....Inches	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Price, Fig. Nos. 425 and 427.....Each	\$5.00	\$7.00	\$11.00	\$20.00	\$29.00
Price, Fig. Nos. 426 and 428.....Each	11.00	14.00	20.00	33.00	48.00
Fig. No. 425, End to End.....Inches	$3\frac{7}{8}$	$4\frac{3}{8}$	$5\frac{3}{8}$	$6\frac{3}{8}$	$7\frac{1}{2}$
Fig. No. 426, Face to Face.....Inches	$4\frac{7}{8}$	$5\frac{7}{8}$	$6\frac{7}{8}$	7	$8\frac{1}{2}$
Fig. No. 427, Centre to End.....Inches	$1\frac{1}{2}$	$2\frac{3}{16}$	$2\frac{1}{16}$	$3\frac{5}{16}$	$3\frac{3}{4}$
Fig. No. 428, Centre to Face.....Inches	$2\frac{1}{8}$	$3\frac{1}{8}$	$3\frac{5}{8}$	$4\frac{1}{4}$	$4\frac{1}{2}$
Diameter of Flanges.....Inches	$4\frac{1}{2}$	5	6	7	$7\frac{1}{2}$

For List Prices on drilling, see page 340.

Order by Figure Number.

VALVES

*Jenkins "Sterling" Bronze Globe and Angle Valves**Extra Heavy—Union Bonnet—Regrinding**300 Lbs. Steam Pressure**500 Lbs. Water Pressure*Globe, Screwed
Fig. No. 500Angle, Screwed
Fig. No. 502Globe, Flanged
Fig. No. 501Angle, Flanged
Fig. No. 503

LIST PRICES—Fig. Nos. 500, 501, 502, 503

Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1
Face, Globe or Angle, Screwed Each	\$3.00	\$3.50	\$4.00	\$5.00	\$ 6.50
Face, Globe or Angle, Flanged Each	.....	.....	6.00	7.50	10.00
End to End, Globe, Screwed Inches	$2\frac{3}{8}$	$2\frac{3}{8}$	$2\frac{3}{4}$	$3\frac{1}{4}$	$3\frac{3}{4}$
Centre to End, Angle, Screwed Inches	$1\frac{3}{16}$	$1\frac{3}{16}$	$1\frac{3}{8}$	$1\frac{5}{8}$	$1\frac{7}{8}$
Face to Face, Globe, Flanged Inches	.....	.....	4	$4\frac{3}{4}$	$5\frac{1}{2}$
Centre to Face, Angle, Flanged Inches	.....	.....	$2\frac{1}{4}$	$2\frac{5}{8}$	$2\frac{7}{8}$
Diameter of Flanges Inches	.....	.....	$3\frac{1}{2}$	4	$4\frac{1}{2}$
Inches	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Face, Globe or Angle, Screwed Each	\$ 8.25	\$11.00	\$16.00	\$33.00	\$45.00
Face, Globe or Angle, Flanged Each	13.00	17.00	24.00	43.00	57.00
End to End, Globe, Screwed Inches	$4\frac{3}{8}$	5	$6\frac{1}{8}$	$7\frac{1}{4}$	$8\frac{3}{8}$
Centre to End, Angle, Screwed Inches	$2\frac{3}{16}$	$2\frac{1}{2}$	$3\frac{1}{16}$	$3\frac{5}{8}$	$4\frac{3}{16}$
Face to Face, Globe, Flanged Inches	6	7	8	9	10
Centre to Face, Angle, Flanged Inches	$3\frac{1}{4}$	$3\frac{3}{4}$	4	$4\frac{3}{4}$	$5\frac{1}{8}$
Diameter of Flanges Inches	5	6	$6\frac{1}{2}$	$7\frac{1}{2}$	$8\frac{1}{4}$

For List Prices on drilling, see page 341.
Order by Figure Number.

VALVES

*Jenkins Globe and Angle Valves**Iron Body—Standard Pattern—Bronze Mounted*

150 Lbs. Steam Pressure

250 Lbs. Water Pressure

Globe, Screwed
Fig. No. 141Globe, Flanged
Fig. No. 142Angle, Screwed
Fig. No. 143Angle, Flanged
Fig. No. 144

LIST PRICES—Fig. Nos. 141, 142, 143, 144

Size.....Inches	2	2½	3	3½	4	†4½	5
Price Globe or Angle, Screwed... Each	10.00	12.00	16.75	19.50	24.00	32.00	40.00
Price Globe or Angle, Flanged... Each	11.75	14.00	18.50	21.50	26.00	34.00	42.00
End to End Globe, Screwed...Inches	6½	7¾	9¾	10	12	12½	13¼
Center to End Angle, Screwed...Inches	3½	3¾	4½	5	6	6½	6¾
Face to Face Globe, Flanged...Inches	7½	8	9¼	10	11¾	12½	13½
Center to Face Angle, Flanged...Inches	3¾	4½	4¾	5¾	5¾	6¼	6½
Diameter of Flanges.....Inches	6	7	7½	8½	9	9¼	10

Size.....Inches	6	†7	8	†9	10	12
Price Globe or Angle, Screwed... Each	48.00	80.00	90.00	121.00	130.00	185.00
Price Globe or Angle, Flanged... Each	50.00	80.00	90.00	121.00	130.00	185.00
End to End Globe, Screwed...Inches	16	16½	18¾	20	21½	25¾
Center to End Angle, Screwed...Inches	8	8¼	9¾	10	10¾	12¾
Face to Face Globe, Flanged...Inches	16	16¼	18½	20	21¼	24½
Face to Face Angle, Flanged...Inches	8	8	9¼	10	10½	12¼
Diameter of Flanges.....Inches	11	12½	13½	15	16	19

†Standard practice of manufacturers urges the discontinuance of these sizes which are considered as special.

For List Price on drilling, see page 340.

Order by Figure Number.

VALVES

Jenkins Globe and Angle Valves

Iron Body—Extra Heavy Pattern—Composition Mounted—Regrinding
250 Lbs. Steam Pressure 400 Lbs. Water Pressure



Globe Valve, Screwed
Fig. No. 162-A



Globe Valve, Flanged
Fig. No. 162



Angle Valve, Screwed
Fig. No. 163-A



Angle Valve, Flanged
Fig. No. 163

LIST PRICES—Fig. Nos. 162, 162-A, 163, 163-A

.....Inches	2	2½	3	3½	4	4½	5
ce, Globe or Angle, Screwed..Each	\$16.00	\$19.00	\$24.00	\$28.00	\$38.00	\$44.00	\$53.00
ce, Globe or Angle, Flanged..Each	18.00	21.00	26.00	30.00	40.00	46.00	55.00
l to End, Globe, Screwed...Inches	9	9	11½	12½	12¾	14	14¾
tre to End, Angle, Screwed..Inches	4⅞	5⅞	5⅞	6½	7	7½	7¾
e to Face, Globe, Flanged...Inches	9¾	10	11¾	12¾	14	14¾	15¾
tre to Face, Angle, Flanged..Inches	4⅞	5⅞	5⅞	6½	7	7½	7¾
meter of Flanges.....Inches	6½	7½	8¼	9	10	10½	11

.....Inches	6	7	8	9	10	12
ce, Globe or Angle, Screwed.....Each	\$70.00	100.00	110.00	165.00	180.00	230.00
ce, Globe or Angle, Flanged.....Each	73.00	100.00	110.00	165.00	180.00	230.00
l to End, Globe, Screwed.....Inches	17	18	21	23	24½	27
tre to End, Angle, Screwed.....Inches	8¾	9½	10½	11½	12¼	14
e to Face, Globe, Flanged.....Inches	18	19½	21	23	24½	27
tre to Face, Angle, Flanged.....Inches	8¾	9½	10½	11½	12¼	14
meter of Flanges.....Inches	12½	14	15	16¼	17½	20½

Standard practice of manufacturers urges the discontinuance of these sizes which are considered as special.

For List Prices on drilling, see page 341.

Order by Figure Number.

VALVES

Jenkins Standard Bronze Check Valves

For 150 Lbs. Working Pressure



Horizontal

Screwed—Fig. No. 117

Flanged—Fig. No. 120



Angle

Screwed—Fig. No. 118

Flanged—Fig. No. 120-A



Vertical

Screwed—Fig. No. 119

Flanged—Fig. No. 120-B

Horizontal, with Drip Cock (Not Illustrated), Screwed—Fig. No. 657

Swing Check, Screwed
Fig. No. 475Swing Check, Flanged
Fig. No. 476

LIST PRICES—Fig. Nos. 117, 118, 119, 120, 120-A, 120-B, 657

Size.....Inches	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Price, Screwed.....Each	1.10	1.10	1.20	1.30	1.90	2.60	3.60	5.00	7.50	14.00	21.00
Price, Flanged.....Each	.....	.....	.....	4.00	5.00	6.00	8.00	10.00	15.00	23.00	32.00
Price, Fig. No. 657.....Each	.....	.....	.....	2.60	3.30	4.25	5.50	.....	.....	.....	.....
End to End, No. 117....In.	$1\frac{9}{16}$	$2\frac{1}{8}$	$2\frac{3}{8}$	$2\frac{3}{4}$	$3\frac{5}{16}$	$3\frac{13}{16}$	$4\frac{1}{4}$	$4\frac{7}{8}$	$5\frac{3}{4}$	$6\frac{5}{8}$	$8\frac{1}{2}$
Centre to End, No. 118...In.	$\frac{13}{16}$	$1\frac{1}{16}$	$1\frac{3}{16}$	$1\frac{3}{8}$	$1\frac{1}{2}$	$1\frac{3}{4}$	$2\frac{1}{16}$	$2\frac{1}{4}$	$2\frac{7}{8}$	$3\frac{1}{4}$	$4\frac{1}{4}$
End to End, No. 119....In.	$1\frac{3}{4}$	$2\frac{3}{8}$	$2\frac{9}{16}$	$3\frac{3}{16}$	$3\frac{1}{8}$	$4\frac{1}{8}$	$4\frac{1}{2}$	$5\frac{1}{4}$	$5\frac{13}{16}$	$7\frac{3}{8}$	$9\frac{1}{16}$
Face to Face, No. 120...In.	.....	.....	.....	$3\frac{1}{16}$	$3\frac{5}{8}$	4	$4\frac{3}{8}$	$4\frac{7}{8}$	6	$6\frac{3}{4}$	$7\frac{1}{2}$
Centre to Face, No. 120A...In.	.....	.....	.....	$2\frac{1}{16}$	$2\frac{3}{8}$	$2\frac{5}{8}$	$2\frac{15}{16}$	$3\frac{3}{16}$	$3\frac{3}{4}$	$4\frac{1}{4}$	$4\frac{9}{16}$
Face to Face No. 120B....In.	.....	.....	.....	$3\frac{7}{16}$	$3\frac{13}{16}$	$4\frac{3}{8}$	$4\frac{13}{16}$	$5\frac{1}{2}$	$6\frac{1}{4}$	$7\frac{3}{8}$	$9\frac{1}{16}$
Diam. of Flanges.....In.	.....	.....	.....	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	6	7	$7\frac{1}{2}$

LIST PRICES—Fig. Nos. 475, 476

Size.....Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Price, Screwed.....Each	1.20	1.20	1.30	1.90	2.60	3.60	5.00	7.50	14.00	21.00
Price, Flanged.....Each	.....	.....	4.00	5.00	6.00	8.00	10.00	15.00	23.00	32.00
End to End, Screwed.....Inches	$2\frac{1}{4}$	$2\frac{7}{16}$	$2\frac{3}{4}$	$3\frac{5}{16}$	$3\frac{13}{16}$	$4\frac{1}{4}$	$4\frac{7}{8}$	$5\frac{3}{4}$	$6\frac{5}{8}$	$8\frac{1}{2}$
Face to Face, Flanged.....Inches	.....	.....	$3\frac{1}{16}$	$3\frac{5}{8}$	4	$4\frac{3}{8}$	$4\frac{7}{8}$	6	$6\frac{3}{4}$	$7\frac{1}{2}$
Diameter of Flanges.....Inches	.....	.....	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	6	7	$7\frac{1}{2}$

For List Prices on drilling, see page 340.
Order by Figure Number.

VALVES

Jenkins "Reliance" Bronze Check Valves

Medium Pressure—Regrinding

For 200 Lbs. Working Steam Pressure



Horizontal Check

Screwed—Fig. No. 443

Flanged—Fig. No. 444



Vertical Check

Screwed—Fig. No. 447

Flanged—Fig. No. 448



Swing Check

Screwed—Fig. No. 449



Swing Check

Flanged—Fig. No. 450

LIST PRICES—Fig. Nos. 443, 444, 447, 448

Size.....Inches	1/8	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3
Price, Screwed.....Each	1.15	1.15	1.35	1.70	2.25	3.15	4.50	6.30	9.90	18.00	26.00
Price, Flanged.....Each				4.00	5.00	7.00	10.00	13.00	18.00	30.00	43.00
End to End, No. 443...In.	1 5/8	2 1/16	2 1/8	2 3/8	2 15/16	3 3/8	3 7/8	4 3/8	5 3/8	6 3/8	7 1/2
End to End, No. 447...In.		1 3/4	1 15/16	2 3/16	2 9/16	3	3 5/16	3 3/4	4 11/16	5 5/16	6 7/32
Face to Face, No. 444...In.				3 5/8	4 1/8	4 5/8	4 7/8	5 7/8	6 7/8	7	8 1/2
Face to Face, No. 448...In.				2 3/16	2 9/16	3	3 5/16	3 3/4	4 11/16	5 5/16	6 7/32
Diam. of Flanges....Inches				3	3 1/2	4	4 1/2	5	6	7	7 1/2

LIST PRICES—Fig. Nos. 449, 450

Size.....Inches	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3
Price, Screwed.....Each	2.50	2.50	2.75	3.10	4.00	5.50	7.00	10.00	19.00	27.00
Price, Flanged.....Each			9.00	10.00	12.50	17.00	21.00	35.00	50.00	65.00
End to End, Screwed...Inches	2 1/8	2 1/8	2 11/16	2 13/16	3 5/16	3 7/8	4 1/4	5 1/4	6 3/16	6 11/16
Face to Face, Flanged...Inches			3 7/8	4 3/8	5	5 5/8	6 1/8	7 3/8	8 3/8	9
Diameter of Flanges...Inches			3	3 1/2	4	4 1/2	5	6	7	7 1/2

For List Prices on drilling, see page 340.
Order by Figure Number.

VALVES

Jenkins Extra Heavy Bronze Check Valves

“Sterling” Horizontal and Angle—Regrinding

Swing—Renewable Discs

300 Lbs. Steam Pressure

500 Lbs. Water Pressure



Horizontal Check
Regrinding
Screwed—Fig. No. 518
Flanged—Fig. No. 519
Angle Check (Not Illustrated)
Screwed—Fig. No. 520
Flanged—Fig. No. 521

Swing Check
Renewable Disc
Can be used in Horizontal
or Vertical Position
Screwed—Fig. No. 260
Flanged—Fig. No. 262

LIST PRICES—Fig. Nos. 518, 519, 520, 521

Size.....Inches	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3
Price, Screwed.....Each	2.50	2.50	3.00	3.50	4.50	5.50	7.75	11.50	21.00	30.00
Price, Flanged.....Each			5.00	6.50	8.50	10.50	14.25	20.00	31.00	42.00
End to End, No. 518.....Inches	2 3/8	2 3/8	2 3/4	3 1/4	3 3/4	4 3/8	5	6 1/8	7 1/4	8 3/8
Centre to End, No. 520.....Inches	1 1/16	1 3/16	1 3/8	1 5/8	1 7/8	2 1/8	2 1/2	3 1/8	3 5/8	4 3/16
Face to Face, No. 519.....Inches			4	4 3/4	5 1/2	6	7	8	9	10
Centre to Face, No. 521.....Inches			2 1/4	2 5/8	2 7/8	3 1/4	3 3/4	4	4 3/4	5 1/8
Diameter of Flanges.....Inches			3 1/2	4	4 1/2	5	6	6 1/2	7 1/2	8 1/4

LIST PRICES—Fig. Nos. 260, 262

Size.....Inches	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3
Price, Screwed.....Each	3.00	3.50	4.50	5.50	7.75	11.50	21.00	30.00
Price, Flanged.....Each	5.00	6.50	8.50	10.50	14.25	20.00	31.00	42.00
End to End, Screwed.....Inches	2 1/8	3 1/2	4 1/8	4 5/8	5 3/8	6 1/4	7 1/2	8 3/4
Face to Face, Flanged.....Inches	3 3/4	4 1/4	4 3/4	5 1/2	6 1/4	7 1/4	8 1/4	9 1/2
Diameter of Flanges.....Inches	3 1/2	4	4 1/2	5	6	6 1/2	7 1/2	8 1/4

For List Prices on drilling, see page 341.
Order by Figure Number.

VALVES

*Jenkins Standard Iron Body Check Valves**Horizontal, Angle, Vertical—Renewable Disc**150 Lbs. Working Pressure*

Horizontal Check
Screwed—Fig. No. 151
Flanged—Fig. No. 153



Angle Check
Screwed—Fig. No. 152
Flanged—Fig. No. 153-A



Sectional View of
Horizontal Check, Flanged

Vertical Check
(Not Illustrated)
Screwed—Fig. No. 152-A
Flanged—Fig. No. 153-B

LIST PRICES

Size.....Inches	2	2½	3	3½	4	4½	5	6	7	8
Price, Screwed.....Each	8.00	11.00	14.00	17.00	20.00	25.00	30.00	40.00	65.00	80.00
Price, Flanged.....Each	10.00	13.00	16.50	20.00	23.00	28.00	33.00	43.00	65.00	80.00
End to End, No. 151...In.	6½	7¾	9¾	10	12	12⅝	13¼	16	16½	18¾
Centre to End, No. 152...In.	3½	3⅞	4⅞	5	6	6⅝	6⅝	8	8¼	9¾
End to End, No. 152-A...In.	6½	7¾	9¾	10	12	12⅝	13¼	16	16½	18¾
Face to Face, No. 153...In.	7⅞	7½	9¼	10	11¾	12½	13⅞	16	16¼	18½
End to Face, No. 153-A...In.	3⅞	4½	4⅝	5⅝	5⅞	6¼	6½	8	8	9¼
Face to Face, No. 153-B...In.	7⅞	7½	9¼	10	11¾	12½	13⅞	16	16¼	18½
Diam. of Flanges...Inches	6	7	7½	8½	9	9¼	10	11	12½	13½

†Standard practice of manufacturers urges the discontinuance of these sizes which are considered as special.

For List Prices on drilling, see page 340.

Order by Figure Number.

VALVES

Jenkins Iron Body Swing Check Valves
Standard F.M.

Fire Underwriters Approved Pattern
150 Lbs. Working Pressure

Extra Heavy
250 Lbs. Working Pressure



Standard F.M., Screwed
Fig. No. 478

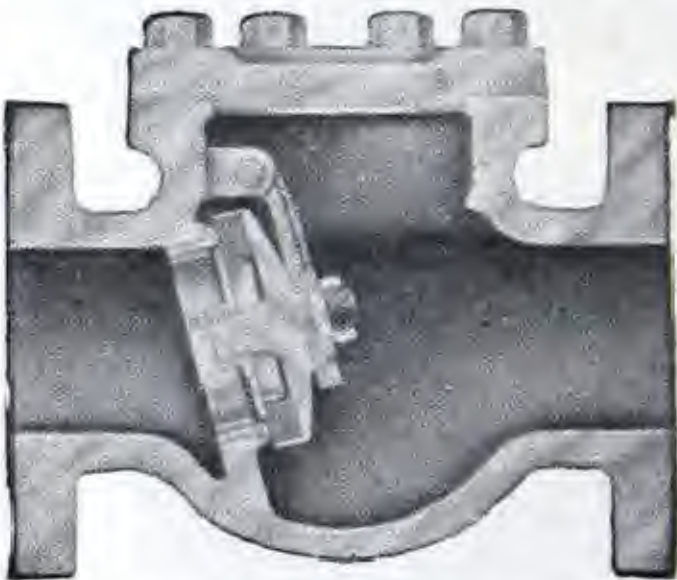
Standard F.M.,
Hub End
(Not Illustrated)
Fig. No. 479



Standard F.M., Flanged
Fig. No. 477



Extra Heavy, Screwed
Fig. No. 338



Extra Heavy, Flanged
Fig. No. 339

LIST PRICES—Fig. Nos. 477, 478, 479

Size.....Inches	2½	3	3½	4	5	6	8	10	12
Price, Screwed.....Each	12.00	13.50	17.50	20.00	30.00	36.00	70.00	.....	.....
Price, Flanged.....Each	14.50	17.00	21.00	24.00	34.00	41.00	75.00	115.00	168.00
Price, Hub End.....Each	.....	19.00	.....	27.00	.....	45.00	82.50	125.00	185.00
End to End, Screwed...Inches	8	9	10	11	12 7/16	14 3/4	.....	.....	.....
Face to Face, Flanged..Inches	8 5/8	9 5/8	10 1/8	12 7/8	13 9/16	15 1/8	18	23 1/4	24 5/8
End to End, Hub End..Inches	.....	13	.....	15 1/2	.....	18 3/4	23 1/4	27 5/8	29 3/8
Depth of Hub.....Inches	.....	3 1/2	.....	3 1/2	.....	3 1/2	4	4	4

LIST PRICES—Fig. Nos. 338, 339

Size.....Inches	2	2½	3	4	5	6	8
Price, Screwed.....Each	15.00	20.00	28.00	41.00	54.00	66.00	100.00
Price, Flanged.....Each	17.00	22.00	30.00	44.00	57.00	70.00	105.00
End to End, Screwed.....Inches	7 3/4	9	10 1/4	12 3/4	15	17	19 1/2
Face to Face, Flanged.....Inches	9	10	11 3/4	13 3/4	15 1/2	17	20
Diameter of Flanges.....Inches	6 1/2	7 1/2	8 1/4	10	11	12 1/2	15

For List Prices on drilling see:—Standard, page 340; Extra Heavy, page 341.
Order by Figure Number.

VALVES

Jenkins Discs



Square Hole Disc—Fig. No. 101

Round Hole Disc—Fig. No. 223

LIST PRICES

Size.....Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$
Fig. No. 101.....Each	.....	.....	.....	.10	.12	.18	.24	.36	.....
Fig. No. 223.....Each	.06	.08	.08	.10	.12	.18	.24	.36	.48

Size.....Inches	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	6	7	8	9
Fig. No. 223.....Each	.80	1.00	1.20	1.40	1.60	2.00	2.40	2.80	3.60

Size.....Inches	10	12	14	16	18	20	22	24
Fig. No. 223.....Each	4.50	5.00	7.00	8.00	10.00	12.00	15.00	18.00

Square Hole Discs, Fig. 101, are used only in $\frac{3}{4}$, 1, $1\frac{1}{4}$, $1\frac{1}{2}$ and 2-inch Jenkins Valves. In valves sizes $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, and $2\frac{1}{2}$ inch and above, Round Hole Discs, Fig. 223, are used.

SCHEDULE OF PRINCIPAL COMPOUNDS

and Service for which Jenkins Discs are recommended.

Composition No. 119. This is the disc which is regularly used in all Jenkins Standard Globe, Angle, Cross, Y or Blow-off, Safety and Radiator Valves when intended for *steam service*. It is *dark red* in color. The composition is tough and flexible in service when under steam pressure. It shows remarkable freedom from cracking and flaking, and unrivalled durability in working steam pressures up to 150 pounds.

Composition No. 80. A disc of *dark gray* composition for steam service. It is extremely hard although sufficiently elastic under pressure to insure perfect tightness.

Composition No. 110. A tough, semi-hard disc, especially recommended for hot water service. This is the composition regularly used in Jenkins Check Valves, both standard and extra heavy, horizontal and swing patterns, when intended for boiler feed lines and returns.

Composition No. 93. Rubber disc made expressly for cold water, gas or air service, and regularly supplied in all Jenkins Globe, Angle or Check Valves, when intended for such service. This is a tough, pliable composition, suitable for hydraulic pressures up to 350 pounds.

Composition No. 94. A soft, tough, elastic disc for low pressures of water, gas or air. Suitable for use in valves or other devices where a tight closure is desired with a minimum amount of pressure applied to disc.

Order by Figure Number and Composition Number.

VALVES

Jenkins Standard Bronze Gate Valves

Inside Screw—Stationary Stem

125 Lbs. Steam Pressure

175 Lbs. Water Pressure

†Outside Screw and Yoke

125 Lbs. Steam Pressure

150 Lbs. Water Pressure



Stationary Stem
Screwed
Fig. No. 300



Stationary Stem
Flanged
Fig. No. 301



†O.S. and Y. Screwed
Fig. No. 305
Flanged (Not Illustrated)
Fig. No. 305-A

LIST PRICES—Fig. Nos. 300, 301

Size.....Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1
Price, Screwed.....Each	1.45	1.45	1.65	2.05	2.80
Price, Flanged.....Each	.....	.....	.....	9.00	10.25
End to End, Screwed..Inches	$1\frac{1}{8}$	$1\frac{1}{8}$	$2\frac{3}{16}$	$2\frac{3}{8}$	$2\frac{3}{4}$
Face to Face, Flanged..Inches	.....	.....	.....	$3\frac{3}{8}$	$3\frac{1}{2}$
Diameter of Flanges...Inches	.....	.....	.....	$3\frac{1}{2}$	4

Size.....Inches	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Price, Screwed.....Each	3.70	5.00	7.30	13.00	19.00
Price, Flanged.....Each	12.00	15.00	25.00	33.00	39.00
End to End, Screwed..Inches	$3\frac{1}{8}$	$3\frac{9}{16}$	$3\frac{1}{2}$	5	$5\frac{1}{8}$
Face to Face, Flanged..Inches	$4\frac{1}{2}$	$4\frac{7}{8}$	$5\frac{3}{4}$	$6\frac{1}{2}$	$7\frac{3}{8}$
Diameter of Flanges...Inches	$4\frac{1}{2}$	5	6	7	$7\frac{1}{2}$

LIST PRICES—Fig. Nos. 305, 305-A

Size.....Inches	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Price, Screwed.....Each	7.50	8.50	9.70	12.00	16.30	25.00	40.50
Price, Flanged.....Each	13.20	14.00	16.00	20.00	30.00	38.50	52.00
End to End, Screwed..Inches	$2\frac{3}{8}$	$2\frac{3}{4}$	$3\frac{1}{8}$	$3\frac{1}{4}$	$3\frac{1}{2}$	5	$5\frac{1}{8}$
Face to Face, Flanged..Inches	$3\frac{3}{8}$	$3\frac{1}{2}$	$4\frac{1}{2}$	$4\frac{7}{8}$	$5\frac{3}{4}$	$6\frac{1}{2}$	$7\frac{3}{8}$
Diameter of Flanges...Inches	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	6	7	$7\frac{1}{2}$

†O.S. and Y. Gate Valves, sizes $\frac{3}{4}$ to 2 inches inclusive, are Fire Underwriters Approved
Patterns and bear identification mark F.M.

For List Prices on drilling, see page 340.

Order by Figure Number.

VALVES

Jenkins Medium Bronze Gate Valves

Inside Screw—Stationary StemOutside Screw and Yoke

175 Lbs. Steam Pressure

250 Lbs. Water Pressure



Stationary Stem
Screwed—Fig. No. 270
Flanged—Fig. No. 271



Outside Screw and Yoke
Screwed—Fig. No. 275
Flanged—Fig. No. 276

LIST PRICES—Fig. Nos. 270, 271

Size.....Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1
Price, Screwed.....Each	2.35	2.35	2.75	3.25	4.50
Price, Flanged.....Each	.....	.....	.....	10.25	12.50
End to End, Screwed..Inches	$2\frac{5}{16}$	$2\frac{5}{16}$	$2\frac{1}{2}$	$2\frac{7}{8}$	$3\frac{1}{2}$
Face to Face, Flanged..Inches	.....	.....	.....	$3\frac{11}{16}$	$4\frac{1}{4}$
Diameter of Flanges...Inches	.....	.....	.....	4	$4\frac{1}{2}$
Size.....Inches	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Price, Screwed.....Each	6.00	8.00	13.00	20.00	32.50
Price, Flanged.....Each	16.25	21.50	31.00	45.00	67.50
End to End, Screwed..Inches	$3\frac{15}{16}$	$4\frac{9}{32}$	$5\frac{1}{16}$	$5\frac{3}{4}$	7
Face to Face, Flanged..Inches	$4\frac{3}{4}$	$5\frac{1}{16}$	6	$6\frac{13}{16}$	$8\frac{1}{2}$
Diameter of Flanges...Inches	5	6	$6\frac{1}{2}$	$7\frac{1}{2}$	$8\frac{1}{4}$

LIST PRICES—Fig. Nos. 275, 276

Size.....Inches	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Price, Screwed.....Each	8.75	10.25	12.00	15.00	22.00	32.00	50.00
Price, Flanged.....Each	16.00	18.50	22.50	29.00	40.00	58.00	86.00
End to End, Screwed..Inches	$2\frac{7}{8}$	$3\frac{1}{2}$	$3\frac{15}{16}$	$4\frac{9}{32}$	$5\frac{1}{16}$	$5\frac{3}{4}$	7
Face to Face, Flanged..Inches	$3\frac{11}{16}$	$4\frac{1}{4}$	$4\frac{3}{4}$	$5\frac{1}{16}$	6	$6\frac{13}{16}$	$8\frac{1}{2}$
Diameter of Flanges...Inches	4	$4\frac{1}{2}$	5	6	$6\frac{1}{2}$	$7\frac{1}{2}$	$8\frac{1}{4}$

For List Prices on drilling, see page 341.
Order by Figure Number.

VALVES

Jenkins Extra Heavy Bronze Gate Valves

250 Lbs. Steam Pressure

400 Lbs. Water Pressure



Stationary Stem
Screwed
Fig. No. 280



Stationary Stem
Flanged
Fig. No. 281



O. S. & Y. Screwed
Fig. No. 282
Flanged (Not Illustrated)
Fig. No. 283

LIST PRICES—Fig. Nos. 280, 281

Size.....Inches	1/2	3/4	1	1 1/4
Price, Screwed.....Each	\$5.00	6.00	8.00	11.25
Price, Flanged.....Each	.....	13.00	16.00	21.50
End to End, Screwed.....Inches	2 15/16	3 5/16	3 3/4	4 1/4
Face to Face, Flanged.....Inches	.....	4 7/16	5	5 1/2
Diameter of Flanges.....Inches	.....	4	4 1/2	5

Size.....Inches	1 1/2	2	2 1/2	3
Price, Screwed.....Each	\$16.50	23.00	40.00	65.00
Price, Flanged.....Each	30.00	41.00	65.00	100.00
End to End, Screwed.....Inches	4 3/4	5 5/8	6 3/4	7 7/8
Face to Face, Flanged.....Inches	6	7 1/8	8 1/8	9
Diameter of Flanges.....Inches	6	6 1/2	7 1/2	8 1/4

LIST PRICES—Fig. Nos. 282, 283

Size.....Inches	3/4	1	1 1/4	1 1/2	2	2 1/2	3
Price, Screwed.....Each	\$11.50	13.75	17.25	23.50	32.00	52.00	74.50
Price, Flanged.....Each	.....	21.00	27.00	35.50	48.00	76.00	111.00
End to End, Screwed.....Inches	3 5/16	3 3/4	4 1/4	4 3/4	5 5/8	6 3/4	7 7/8
End to End, Flanged.....Inches	.....	5	5 1/2	6	7 1/8	8 1/8	9
Diameter of Flanges.....Inches	.....	4 1/2	5	6	6 1/2	7 1/2	8 1/4

For List Prices on drilling, see page 341.
Order by Figure Number.

VALVES

Jenkins Standard Gate Valves

Iron Body—Bronze Mounted
Inside Screw—Stationary Stem

2" to 16", 125 Lbs. Steam Pressure—175 Lbs. Water Pressure
18" to 24", 100 Lbs. Steam Pressure—125 Lbs. Water Pressure



Screwed
Fig. No. 401



Flanged
Fig. No. 402

LIST PRICES—Fig. No. 401

Size.....Inches	2	2½	3	3½	4	†4½	5
Price.....Each	10.00	11.50	14.00	17.00	19.00	24.00	27.50
End to End, Screwed...Inches	4¾	5½	6	6⅝	7⅛	7½	8⅛
Size.....Inches	6	†7	8	†9	10	12	
Price.....Each	32.50	45.00	54.00	76.00	90.00	125.00	
End to End, Screwed.....Inches	9	9½	10	10½	11½	12½	

LIST PRICES—Fig. No. 402

Size.....Inches	2	2½	3	3½	4	†4½	5
Price.....Each	12.00	13.50	16.50	19.50	23.00	28.00	31.50
Face to Face, Flanged..Inches	5½	6	6¼	7	7½	8	8⅝
Diameter of Flanges...Inches	6	7	7½	8½	9	9¼	10
Size.....Inches	6	†7	8	†9	10	12	14
Price.....Each	36.50	49.00	58.00	81.00	95.00	133.00	181.00
Face to Face, Flanged..Inches	9½	10	10½	11	12	13¼	14½
Diameter of Flanges...Inches	11	12½	13½	15	16	19	21
Size.....Inches	†15	16	18	20	†22	24	
Price.....Each	220.00	260.00	350.00	425.00	530.00	600.00	
Face to Face, Flanged.....Inches	15	15¾	18¼	19	20½	21¾	
Diameter of Flanges.....Inches	22¼	23½	25	27½	29½	32	

†Standard practice of manufacturers urges the discontinuance of these sizes which are considered as special.

For List Prices for drilling, see page 340.

Order by Figure Number.

VALVES

Jenkins Standard Gate Valves

Iron Body—Bronze Mounted
Outside Screw and Yoke

2" to 16", 125 Lbs. Steam Pressure—175 Lbs. Water Pressure
18" to 24", 100 Lbs. Steam Pressure—125 Lbs. Water Pressure



Screwed
Fig. No. 403

Fire Underwriters'
Approved Pattern

Flanged—Fig. No. 404-F.M.

150 Lbs. Water Pressure
Identification Mark "F.M."
Cast on Yoke.

Sizes 2½, 3, 3½, 4, 5, 6,
7, 8, 10, 12, 14 inches.

List Prices and Dimensions same as
Fig. No. 404

Note:—Sizes 3, 4, 5 and 6 inches
have solid bosses for ¾-inch
tapping on either side
at each end.



Flanged
Fig. No. 404

LIST PRICES—Fig. No. 403

Size.....Inches	2	2½	3	3½	4	†4½	5
Price, Screwed.....Each	19.00	20.50	23.50	27.00	32.50	40.00	45.00
End to End.....Inches	4¾	5½	6	6⅝	7⅞	7½	8⅞
Size.....Inches	6	†7	8	†9	10	12	
Price, Screwed.....Each	\$52.00	69.00	86.00	113.00	131.00	172.00	
End to End.....Inches	9	9½	10	10½	11½	12½	

LIST PRICES—Fig. No. 404

Size.....Inches	2	2½	3	3½	4	†4½	5
Price, Flanged.....Each	21.00	22.50	26.00	29.50	36.50	44.00	49.00
Face to Face.....Inches	5½	6	6¼	7	7½	8	8⅝
Diameter of Flanges..Inches	6	7	7½	8½	9	9¼	10
Size.....Inches	6	†7	8	†9	10	12	14
Price, Flanged.....Each	56.00	73.00	90.00	118.00	136.00	180.00	255.00
Face to Face.....Inches	9½	10	10½	11	12	13¼	14½
Diameter of Flanges..Inches	11	12½	13½	15	16	19	21
Size.....Inches	†15	16	18	20	†22	24	
Price, Flanged.....Each	\$310.00	350.00	470.00	565.00	700.00	775.00	
Face to Face.....Inches	15	15¾	18¼	19	20½	21¾	
Diameter of Flanges..Inches	22¼	23½	25	27½	29½	32	

†Standard practice of manufacturers urges the discontinuance of these sizes which are considered as special.

For List Prices on drilling, see page 340.

Order by Figure Number.

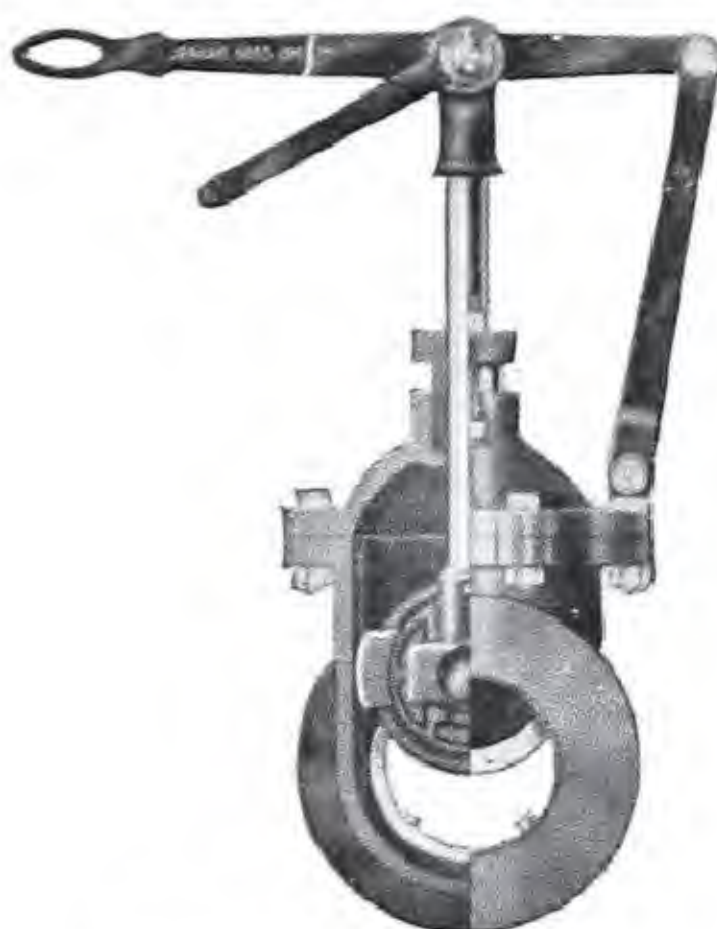
VALVES

*Jenkins Standard Gate Valves**Iron Body—Bronze Mounted**Inside Screw, with Indicator**Sliding Stem and Lever*

2" to 16", 125 Lbs. Steam Pressure—175 Lbs. Water Pressure
 18" to 24", 100 Lbs. Steam Pressure—125 Lbs. Water Pressure



Inside Screw, with Indicator
 Flanged—Fig. No. 406
 Screwed—Fig. No. 405



Sliding Stem and Lever
 Flanged—Fig. No. 408
 Screwed—Fig. No. 407

LIST PRICES—Fig. Nos. 405, 406, 407, 408

Size.....Inches	2	2½	3	3½	4	†4½	5
Price, Screwed.....Each	17.50	19.00	22.00	25.00	30.00	37.00	42.00
Price, Flanged.....Each	19.50	21.00	24.50	27.50	34.00	41.00	46.00
End to End, Screwed..Inches	4¾	5½	6	6⅝	7⅛	7½	8⅛
Face to Face, Flanged..Inches	5½	6	6¼	7	7½	8	8⅝
Diameter of Flanges...Inches	6	7	7½	8½	9	9¼	10

Size.....Inches	6	†7	8	†9	10	12	14
Price, Screwed.....Each	48.00	64.00	80.00	105.00	122.00	160.00	.....
Price, Flanged.....Each	52.00	68.00	84.00	110.00	127.00	168.00	236.00
End to End, Screwed..Inches	9	9½	10	10½	11½	12½	.....
Face to Face, Flanged..Inches	9½	10	10½	11	12	13¼	14½
Diameter of Flanges,..Inches	11	12½	13½	15	16	19	21

Size.....Inches	†15	16	18	20	†22	24
Price, Flanged.....Each	285.00	325.00	435.00	525.00	650.00	725.00
Face to Face, Flanged.....Inches	15	15¾	18¼	19	20½	21¾
Diameter of Flanges.....Inches	22¼	23½	25	27½	29½	32

†Standard practice of manufacturers urges the discontinuance of these sizes which are considered as special.

For List Prices for drilling, see page 340.

Order by Figure Number.

VALVES

Jenkins Standard Gate Valves

Iron Body—Bronze Mounted

Inside Screw—Stationary Stem—Hub Ends

150 Lbs. Water Pressure



Standard Hub End Gate
Fig. No. 400



Underwriters' Type
For use with Indicator Post
Fig. No. 400-F.M.

LIST PRICES—Fig. No. 400

Size.....Inches	4	6	8	10	12
Price.....Each	19.00	32.50	54.00	90.00	125.00
End to End.....Inches	10¾	13½	14½	15½	16¾
Depth of Hub.....Inches	3	3¾	4	4	4

Size.....Inches	14	16	18	20	24
Price.....Each	173.00	250.00	340.00	415.00	590.00
End to End.....Inches	17	17½	19	19	21¾
Depth of Hub.....Inches	4	4	4	4	4

LIST PRICES—Fig. No. 400-F.M.

Size.....Inches	4	6	8	10	12	14
Price.....Each	19.00	32.50	54.00	90.00	125.00	173.00
End to End.....Inches	10¾	13½	14½	15½	16¾	17
Depth of Hub.....Inches	3	3¾	4	4	4	4

Valves are regularly furnished "Open to the Left," or "Counter Clockwise." Can be furnished "Open to Right," or "Clockwise."

Valves are regularly furnished with 2 inch Square Top Nut as illustrated. Fig. No. 400 can be furnished with Iron Hand Wheels at same price.

Fig. No. 400 are suitable for cast iron pipe and can be furnished for steel or wood pipe, prices on application.

Order by Figure Number.

VALVES

Jenkins Medium Gate Valves

Iron Body—Bronze Mounted

175 Lbs. Steam Pressure

250 Lbs. Water Pressure



Stationary Stem
Screwed—Fig. No. 251
Flanged—Fig. No. 255



Outside Screw and Yoke
Flanged—Fig. No. 253
Screwed—Fig. No. 277

LIST PRICES—Fig. Nos. 251, 255

Size.....Inches	2	2½	3	3½	4	†4½	5	6
Price, Screwed.....Each	15.00	17.00	20.00	25.00	28.00	35.00	40.00	50.00
Price, Flanged.....Each	17.50	19.50	23.00	28.00	33.00	40.00	45.00	57.00
End to End, Screwed...Inches	5½	6	7¼	7½	7¾	8¼	8½	8¾
Face to Face, Flanged..Inches	7½	8	9½	10	10½	11	11½	12
Diameter of Flange....Inches	6½	7½	8¼	9	10	10½	11	12½
Size.....Inches	†7	8	†9	10	12	14	†15	16
Price, Screwed.....Each	75.00	87.00	120.00	145.00	185.00			
Price, Flanged.....Each	82.00	94.00	127.00	153.00	195.00	300.00	350.00	400.00
End to End, Screwed...Inches	9¼	10	10¾	11½	12½			
Face to Face, Flanged..Inches	12½	13½	14	15	16	18	18¾	19½
Diameter of Flange....Inches	14	15	16¼	17½	20½	23	24½	25½

LIST PRICES—Fig. Nos. 253, 277

Size.....Inches	2	2½	3	3½	4	†4½	5	6	†7
Price, Screwed.....Each	23.00	25.00	29.00	35.00	40.00	50.00	54.00	65.00	90.00
Price, Flanged.....Each	25.50	27.50	32.00	38.00	45.00	55.00	59.00	72.00	97.00
End to End, Screwed...Inches	5½	6	7¼	7½	7¾	8¼	8½	8¾	9¼
Face to Face, Flanged..Inches	7½	8	9½	10	10½	11	11½	12	12½
Diameter of Flange....Inches	6½	7½	8¼	9	10	10½	11	12½	14

Size.....Inches	8	†9	10	12	14	†15	16	18
Price, Screwed.....Each	110.00	145.00	170.00	215.00	.....	.....	.....	.....
Price, Flanged.....Each	117.00	152.00	178.00	225.00	340.00	400.00	450.00	600.00
End to End, Screwed....Inches	10	10¾	11½	12½	.....	.....	.....	.....
Face to Face, Flanged...Inches	13½	14	15	16	18	18¾	19½	21
Diameter of Flanges....Inches	15	16¼	17½	20½	23	24½	25½	28

†Standard practice of manufacturers urges the discontinuance of these sizes which are considered as special.

For List Prices on drilling, see page 341.

Order by Figure Number.

VALVES

Jenkins Extra Heavy Gate Valves

Iron Body

250 Lbs. Steam Pressure



Stationary Stem
Flanged—Fig. No. 203
Screwed—Fig. No. 203A

Bronze Mounted

400 Lbs. Water Pressure



Outside Screw and Yoke
Flanged—Fig. No. 204
Screwed—Fig. No. 204A

LIST PRICES—Fig. Nos. 203, 203A

Size.....Inches	1½	2	2½	3	3½	4	4½
Price, Fig. No. 203A.....Each	\$25.00	\$27.50	\$33.00	\$45.00	\$57.00	\$60.00	\$77.00
Price, Fig. No. 203.....Each	27.50	30.00	35.50	48.00	60.00	65.00	82.00
Fig. No. 203A, End to End....Inches	6¼	7	8	9	10	11	12¼
Fig. No. 203, Face to Face....Inches	7½	8½	9½	11⅞	11⅞	12	13¼
Diameter of Flange.....Inches	6	6½	7½	8¼	9	10	10½
Size.....Inches	5	6	7	8	9	10	12
Price, Fig. No. 203A.....Each	85.00	100.00	125.00	155.00	225.00	250.00	.....
Price, Fig. No. 203.....Each	90.00	107.00	132.00	162.00	232.00	258.00	335.00
Fig. No. 203A, End to End....Inches	13½	15⅞	16¼	16½	17	18	.....
Fig. No. 203, Face to Face....Inches	15	15⅞	16¼	16½	17	18	19¾
Diameter of Flange.....Inches	11	12½	14	15	16¼	17½	20½

LIST PRICES—Fig. Nos. 204, 204A

Size.....Inches	1½	2	2½	3	3½	4	4½
Price, Fig. No. 204A.....Each	\$33.00	\$35.50	\$41.00	\$54.00	\$67.00	\$72.00	\$92.00
Price, Fig. No. 204.....Each	35.50	38.00	43.50	57.00	70.00	77.00	97.00
Fig. No. 204A, End to End....Inches	6¼	7	8	9	10	11	12¼
Fig. No. 204, Face to Face....Inches	7½	8½	9½	11⅞	11⅞	12	13¼
Diameter of Flange.....Inches	6	6½	7½	8¼	9	10	10½
Size.....Inches	5	6	7	8	9	10	12
Price, Fig. No. 204A.....Each	100.00	115.00	140.00	180.00	250.00	275.00	.....
Price, Fig. No. 204.....Each	105.00	122.00	147.00	187.00	257.00	283.00	390.00
Fig. No. 204A, End to End....Inches	13½	15⅞	16¼	16½	17	18	.....
Fig. No. 204, Face to Face....Inches	15	15⅞	16¼	16½	17	18	19¾
Diameter of Flange.....Inches	11	12½	14	15	16¼	17½	20½

For List Prices on drilling, see page 341.
Order by Figure Number.

VALVES

Jenkins Cast Steel Globe and Angle Valves**Extra Heavy Pattern—Monel Metal Mounted**

‡For 350 Lbs. W.S.P. and a Total Temperature of 800°F.



Globe Valve—Fig. No. 380

Globe Valve, with By-Pass
(Not Illustrated)—Fig. No. 381

Angle Valve—Fig. No. 382

Angle Valve, with By-Pass
(Not Illustrated)—Fig. No. 383

LIST PRICES—Fig. Nos. 380, 382

Size.....Inches	2	2½	3	3½	4	†4½
Price.....Each	\$57.50	\$70.00	\$85.00	\$100.00	\$100.00	\$115.00
Face to Face, Globe....Inches	9¾	10	11¾	12¾	14	14¾
Centre to Face, Angle...Inches	4⅞	5⅞	5⅞	6½	7	7½
Diameter of Flanges....Inches	6½	7½	8¼	9	10	10½

Size.....Inches	5	6	†7	8	10	12
Price.....Each	\$125.00	\$145.00	\$180.00	\$210.00	\$325.00	\$415.00
Face to Face, Globe....Inches	15¾	18	19½	21	24½	27
Centre to Face, Angle...Inches	7¾	8¾	9½	10½	12¼	14
Diameter of Flanges....Inches	11	12½	14	15	17½	20½

LIST PRICES—Fig. Nos. 381, 383

Size.....Inches	4	5	6	†7	8	10	12
Price.....Each	\$175.00	\$200.00	\$220.00	\$255.00	\$255.00	\$375.00	\$480.00
Face to Face, Globe....Inches	14	15¾	18	19½	21	24½	27
Centre to Face, Angle...Inches	7	7¾	8¾	9½	10½	12¼	14
Diameter of Flanges...Inches	10	11	12½	14	15	17½	20½
Centre to Outside By-Pass..Ins.	19	23¼	25½	27¾	31½	36¾	41½

†Standard practice of manufacturers urges the discontinuance of these sizes which are considered as special.

‡For Pressures over 300 pounds, use High Tensile Bolts.

The use of By-Pass is recommended on all large sized valves.

By-Passes are on Side of Globe Valves,—on Back of Angle Valves.

Flanges have ⅛-inch raised face. When ordered faced and drilled, bolt holes will be not faced.

For List Prices on drilling, see page 342.

Order by Figure Number.

VALVES

*Jenkins Cast Steel Gate Valves**Extra Heavy Pattern—Monel Metal Mounted**‡For 350 Lbs. W.S.P. and a Total Temperature of 800°F.*

Inside Screw, Stationary Stem
Flanged—Fig. No. 386

Flanged, with By-Pass
(Not Illustrated)—Fig. No. 387



Outside Screw and Yoke
Flanged—Fig. No. 388

Flanged, with By-Pass
(Not Illustrated)—Fig. No. 389

LIST PRICES—Fig. Nos. 386, 388

Size.....Inches	1½	2	2½	3	3½	4	†4½
Price, Fig. No. 386.....Each	\$40.00	\$41.50	\$52.50	\$64.00	\$78.00	\$ 90.00	\$105.00
Price, Fig. No. 388.....Each	47.50	50.00	62.50	75.00	90.00	105.00	120.00
Face to Face, Flanged..Inches	7½	8½	9½	11⅞	11⅞	12	13¼
Diameter of Flanges...Inches	6	6½	7½	8¼	9	10	10½

Size.....Inches	5	6	†7	8	†9	10	12
Price, Fig. No. 386.....Each	\$115.00	\$130.00	\$155.00	\$185.00	\$230.00	\$280.00	\$340.00
Price, Fig. No. 388.....Each	135.00	155.00	190.00	225.00	.....	340.00	435.00
Face to Face, Flanged..Inches	15	15⅞	16¼	16½	17	18	19¾
Diameter of Flanges...Inches	11	12½	14	15	16¼	17½	20½

LIST PRICES—Fig. Nos. 387, 389

Size.....Inches	6	†7	8	10	12	14	†15	16
Price, Fig. No. 387.....Each	170.00	.....	225.00	325.00	400.00	.....	.....	.....
Price, Fig. No. 389.....Each	205.00	240.00	275.00	400.00	515.00	640.00	640.00	800.00
Face to Face, Flanged..Inches	15⅞	16¼	16½	18	19¾	22½	22½	24
Diameter of Flanges...Inches	12½	14	15	17½	20½	23	24½	25½
Cen. to Outside of By-Pass Inches	.....	.....	16⅞	17¾	20⅝	22⅞	23	26

†Standard practice of manufacturers urges the discontinuance of these sizes which are considered as special.

‡For Pressures over 300 pounds, use High Tensile Bolts.

The use of By-Pass is recommended on all large sized valves.

Flanges have ⅛-inch raised face. When ordered faced and drilled, bolt holes will be spot-faced.

For List Prices on drilling, see page 342.

Order by Figure Number.

VALVES

Jenkins Automatic Equalizing Stop and Check or "Non-Return" Valves

Extra Heavy Pattern—Iron Body—Bronze Mounted

250 Lbs. Working Steam Pressure



Globe Valve—Fig. No. 551



Angle Valve—Fig. No. 553

LIST PRICES—Fig. Nos. 551, 553

Size.....Inches	3	4	5	6	†7	8
Price.....Each	\$45.00	\$60.00	\$80.00	\$95.00	\$120.00	\$145.00
Face to Face, Globe.....Inches	11¾	14	15¾	18	19½	21
Face to Face, Angle.....Inches	5⅞	7	7¾	8¾	9½	10½
Diameter of Flanges.....Inches	8¼	10	11	12½	14	15
Face to Top of Globe.....Inches	15¾	19⅛	21½	24¼	25⅛	27⅛
Face to Top of Angle.....Inches	14¼	18⅛	20⅜	22⅝	23¾	26¾

†Standard practice of manufacturers urges the discontinuance of this size which is considered as special.

These valves are designed to automatically shut off the flow of steam from the header to a boiler in case a tube should burst or other internal rupture occur, thereby suddenly reducing the pressure in that boiler. They also equalize the pressure between the different boilers in a battery, preventing one boiler from working at a lower pressure than another. As the valves can only be opened by the pressure in the boiler to which they are attached, it is impossible to accidentally turn steam into a boiler which is being cleaned.

The valves are cushioned, to prevent chattering, by an internal dashpot, made entirely of bronze, which eliminates the danger of sticking through corrosion. *Care should be taken to install the valves with the spindle in a vertical position only.*

They can be repacked under pressure when wide open; and have renewable seat rings.

In order to distinguish the valves from the regular Extra Heavy Globe and Angle Valves, a brass plate bearing a serial number is fastened to the bonnet flange.

For List Prices on drilling, see page 341.

Order by Figure Number.

VALVES

*Jenkins Automatic Equalizing Stop and Check
or "Non-Return" Valves*

Extra Heavy Pattern—Cast Steel Body—Monel Mounted

†For 350 Lbs. W.S.P. and a Total Temperature of 800°F.



Globe Valve—Fig. No. 554



Angle Valve—Fig. No. 555

LIST PRICES—Fig. Nos. 554, 555

Size.....Inches	4	5	6	†7	8
Price.....Each	\$145.00	\$175.00	\$220.00	\$265.00	\$340.00
Face to Face, Globe.....Inches	14	15¾	18	19½	21
Centre to Face, Angle.....Inches	7	7¾	8¾	9½	10½
Diameter of Flange.....Inches	10	11	12½	14	15
Centre to Top of Globe.....Inches	19½	21½	24¼	25½	27¾
Wheel, Open.. Angle.....Inches	18½	20¾	22½	23¾	26¾

†Standard practice of manufacturers urges the discontinuance of this size which is considered as special.

‡For Pressures over 300 pounds, use High Tensile Bolts.

These valves are designed to automatically shut off the flow of steam from the header to a boiler in case a tube should burst or other internal rupture occur, thereby suddenly reducing the pressure in that boiler. They also equalize the pressure between the different boilers in a battery, preventing one boiler from working at a lower pressure than another. As the valves can only be opened by the pressure in the boiler to which they are attached, it is impossible to accidentally turn steam into a boiler which is being cleaned.

The valves are cushioned, to prevent chattering, by an internal dashpot, made entirely of monel metal, which eliminates the danger of sticking through corrosion. *Care should be taken to install the valves with the spindle in a vertical position only.*

They can be repacked under pressure when wide open; and have renewable seat rings.

In order to distinguish the valves from the regular Extra Heavy Steel Globe and Angle Valves, a brass plate bearing a serial number is fastened to the bonnet flange.

For List Prices on drilling, see page 342.

Order by Figure Number.

VALVES

Reading Cast Steel Globe and Angle Valves

Extra Heavy Pattern—Rising Stem

*350 Lbs. Steam or Hot Oil Pressure and a Total Temperature of 750°F.

†300 Lbs. Steam or Hot Oil Pressure and a Total Temperature of 750°F.

*420 Lbs. Hydraulic Pressure, Non Shock, and a Total Temperature of 450°F.

†350 Lbs. Hydraulic Pressure, Non Shock, and a Total Temperature of 450°F.

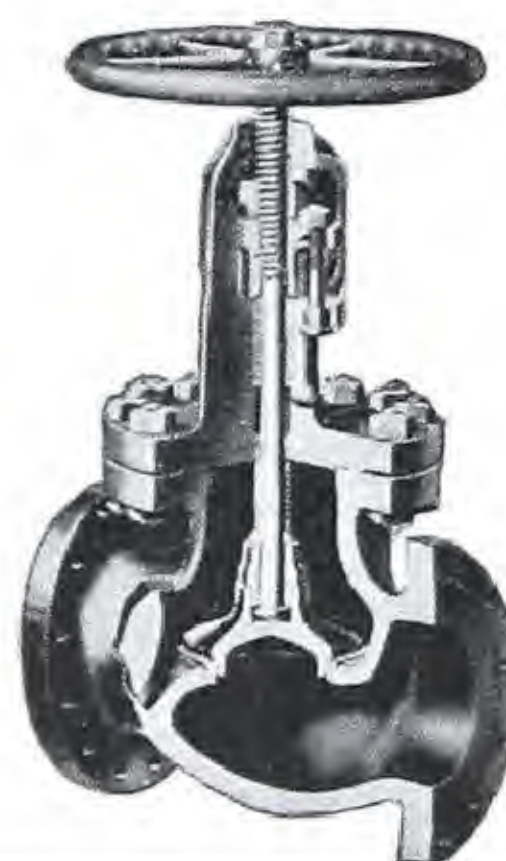
*700 Lbs. Hydraulic Pressure, Non Shock, and a Total Temperature of 100°F.

†500 Lbs. Hydraulic Pressure, Non Shock, and a Total Temperature of 100°F.

Tested to 1000 Lbs. Hydraulic Shell Test at 100°F. Maximum



Globe Valve
Flanged—Fig. No. 2055
Flanged, with By-Pass
(Not Illustrated)—Fig. No. 2056



Angle Valve
Flanged (Not Illustrated)
Fig. No. 2057
Flanged, with By-Pass
(Not Illustrated)—Fig. No. 2058

LIST PRICES

Size	Inches	1½	2	2½	3	3½	4
Price, Fig. Nos. 2055, 2057	Each	\$52.50	57.50	70.00	85.00	100.00	115.00
Center to Face, Globe and Angle	Inches	4½	5¼	5¾	6¼	6⅝	7
Center to Top of Wheel, Globe, Open. ..	Inches	14	14⅝	18¼	18⅞	21⅜	22
Center to Top of Wheel, Angle, Open. ..	Inches	13¾	14¼	17¾	18⅜	20⅝	21¼
Size	Inches	4½	5	6	7	8	
Price, Fig. Nos. 2055, 2057	Each	130.00	145.00	170.00	210.00	245.00	.....
Price, Fig. Nos. 2056, 2058	Each	.....	.....	225.00	265.00	300.00	.....
Center to Face, Globe and Angle	Inches	7½	7⅞	8¾	9⅝	10½	.....
Center to Top of Wheel, Globe, Open. ..	Inches	22⅞	27	27⅞	28¼	34¾	.....
Center to Top of Wheel, Angle, Open. ..	Inches	21½	26	26½	27	33	.....

*When using High Tensile Bolts.

†When using Commercial Bolts.

†Standard practice of manufacturers urges the discontinuance of these sizes which are considered as special.

See pages 304 and 305 for drilling and dimensions of flanges.

List prices given above are for "Class A"—Monel Trimmed, which is the standard trimming; "Class B"—Steel Trimmed; and "Class C"—Bronze Trimmed. These valves can also be furnished in "Class D"—Rustless Steel Trimmed, prices on application.

On the Globe Valves, bosses for by-passes are located one underneath at the center of the valve and one on each side immediately behind each end flange. On the Angle Valves, one boss is located just above the bottom flange and one just below the bonnet flange on the back of the valve. These bosses are suitable for ½-inch by-passes on valves up to 4-inch, and ¾-inch on valves 5 to 8-inch. When by-passes are ordered, they will be furnished built up with screwed valves and fittings.

For List Prices on drilling, see page 342.

Order by Figure Number and Class of Trim.

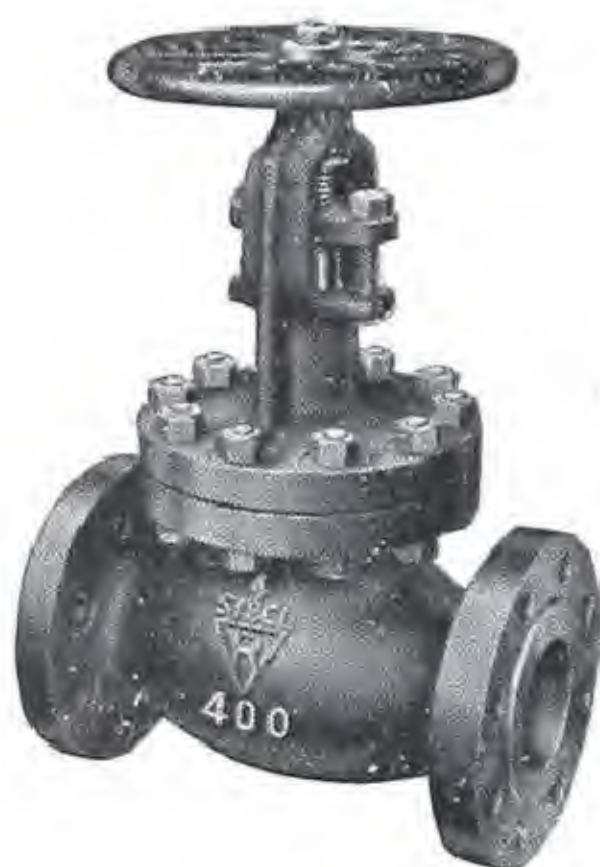
VALVES

Reading Cast Steel Globe and Angle Valves

400 Lbs. W.S.P.—Rising Stem

400 Lbs. Steam or Hot Oil Pressure and a Total Temperature of 750°F.
 500 Lbs. Hydraulic Pressure, Non Shock, and a Total Temperature of 450°F.
 750 Lbs. Hydraulic Pressure, Non Shock, and a Total Temperature of 100°F.

Tested to 1000 Lbs. Hydraulic Shell Test at 100°F. Maximum



Globe Valve
 Flanged—Fig. No. 4055
 Flanged, with By-Pass
 (Not Illustrated)—Fig. No. 4056

Angle Valve
 Flanged (Not Illustrated)
 Fig. No. 4057
 Flanged, with By-Pass
 (Not Illustrated)—Fig. No. 4058



LIST PRICES

Size.....Inches	1½	2	2½	3	3½
Price, Fig. Nos. 4055, 4057.....Each	\$97.00	\$110.00	\$135.00	\$165.00	\$200.00
Center to Face, Globe and Angle.....Inches	4¾	5¾	6½	7	7½
Center to Top of Wheel, Globe, Open.....Inches	14	14⅝	18¼	18⅞	21⅜
Center to Top of Wheel, Angle, Open.....Inches	13¾	14¼	17¾	18⅞	20⅝

Size.....Inches	4	5	6	8	
Price, Fig. Nos. 4055, 4057.....Each	\$243.00	\$308.00	\$380.00	\$535.00	.....
Price, Fig. Nos. 4056, 4058.....Each	.....	.....	500.00	655.00	.....
Center to Face, Globe and Angle.....Inches	8	9	9¾	11¾	.....
Center to Top of Wheel, Globe, Open.....Inches	22	27	27⅞	34¾	.....
Center to Top of Wheel, Angle, Open.....Inches	21¼	26	26½	33	.....

See pages 310 and 311 for drilling and dimensions of flanges.

List Prices given above are for "Class A"—Monel Trimmed, which is the standard trimming; "Class B"—Steel Trimmed; and "Class C"—Bronze Trimmed. These valves can also be furnished in "Class D"—Rustless Steel Trimmed, prices on application.

On the Globe Valves, bosses for by-passes are located one underneath at the center of the valve and one on each side immediately behind each end flange. On the Angle Valves, one boss is located just above the bottom flange and one just below the bonnet flange on the back of the valve. These bosses are suitable for ½-inch by-passes on valves up to 4-inch, and ¾-inch on valves 5 to 8-inch. When by-passes are ordered, they will be furnished built up with screwed valves and fittings.

For List Prices on drilling, see page 342.

Order by Figure Number and Class of Trim.

VALVES

Reading Cast Steel Swing Check Valves

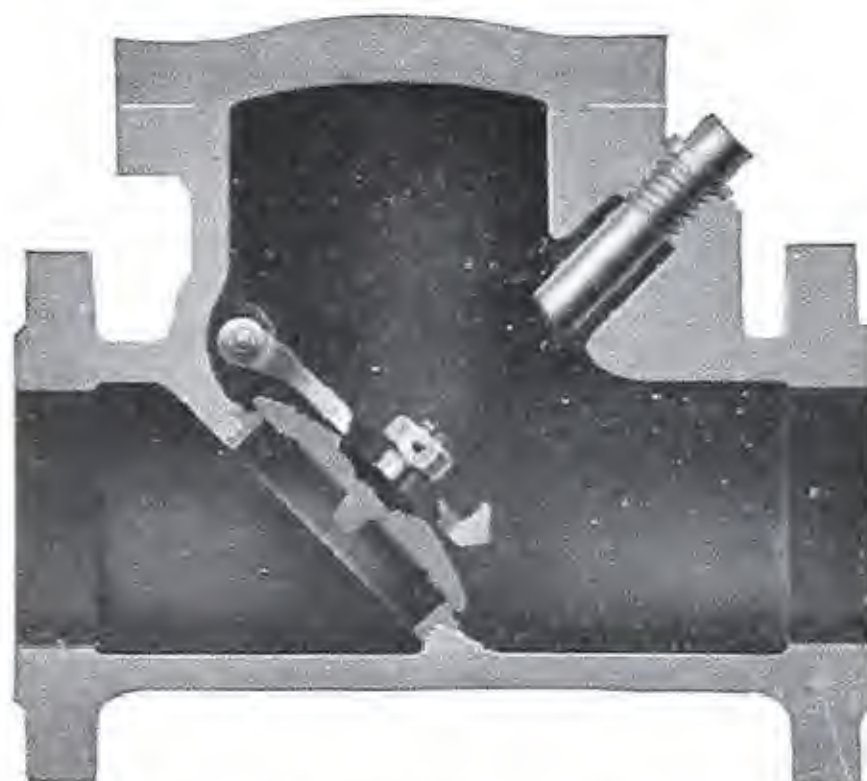
Extra Heavy Pattern

- *350 Lbs. Steam or Hot Oil Pressure and a Total Temperature of 750°F.
 ‡300 Lbs. Steam or Hot Oil Pressure and a Total Temperature of 750°F.
 *420 Lbs. Hydraulic Pressure, Non Shock, and a Total Temperature of 450°F.
 ‡350 Lbs. Hydraulic Pressure, Non Shock, and a Total Temperature of 450°F.
 *700 Lbs. Hydraulic Pressure, Non Shock, and a Total Temperature of 100°F.
 ‡500 Lbs. Hydraulic Pressure, Non Shock, and a Total Temperature of 100°F.

Tested to 1000 Lbs. Hydraulic Shell Test at 100°F. Maximum



Check Valve, Flanged
Fig. No. 2227



Sectional View

LIST PRICES

Size.....Inches	2	2½	3	3½	4
Price.....Each	\$45.00	\$55.00	\$62.50	\$72.50	\$85.00
Center to Face, Flanges.....Inches	4½	5⅞	6⅜	7	7¾
Size.....Inches	5	6	†7	8	
Price.....Each	\$100.00	\$123.00	\$150.00	\$177.00	
Center to Face, Flanges.....Inches	8½	9½	9⅝	9⅝	

*When using High Tensile Bolts.

‡When using Commercial Bolts.

†Standard practice of manufacturers urges the discontinuance of this size which is considered as special.

See pages 304 and 305 for drilling and dimensions of flanges.

The Check Valves are straightway in type, but the angle of the seat is such that the valve may be used in either horizontal or vertical pipe lines.

List Prices given above are for "Class A"—Monel Trimmed which is the standard trimming; "Class B"—Steel Trimmed; and "Class C"—Bronze Trimmed. These valves can also be furnished in "Class D"—Rustless Steel Trimmed, prices on application.

For List Prices on drilling, see page 342.

Order by Figure Number and Class of Trim.

VALVES

*Reading Cast Steel Swing Check Valves**400 Lbs. W.S.P.*

*400 Lbs. Steam or Hot Oil Pressure and a Total Temperature of 750°F.
 500 Lbs. Hydraulic Pressure, Non Shock, and a Total Temperature of 450°F.
 750 Lbs. Hydraulic Pressure, Non Shock, and a Total Temperature of 100°F.*

Tested to 1000 Lbs. Hydraulic Shell Test at 100°F. Maximum

Check Valve, Flanged
Fig. No. 4047



Sectional View

LIST PRICES

Size.....Inches	2	2½	3	3½
Price.....Each	\$93.00	\$114.00	\$133.00	\$157.00
Center to Face, Flanges.....Inches	5¾	6½	7	7½
Size.....Inches	4	5	6	8
Price.....Each	\$180.00	\$212.00	\$275.00	\$386.00
Center to Face, Flanges.....Inches	8	9	9¾	11¾

See pages 310 and 311 for drilling and dimensions of flanges.

The Check Valves are straightway in type, but the angle of the seat is such that the valve may be used in either horizontal or vertical pipe lines.

List Prices given above are for "Class A"—Monel Trimmed which is the standard trimming; "Class B"—Steel Trimmed; and "Class C"—Bronze Trimmed. These valves can also be furnished in "Class D"—Rustless Steel Trimmed, prices on application.

For List Prices on drilling, see page 342.

Order by Figure Number and Class of Trim.

VALVES

Reading Cast Steel Gate Valves

Extra Heavy Pattern—Outside Screw and Yoke

*350 Lbs. Steam or Hot Oil Pressure and a Total Temperature of 750°F.

†300 Lbs. Steam or Hot Oil Pressure and a Total Temperature of 750°F.

*420 Lbs. Hydraulic Pressure, Non Shock, and a Total Temperature of 450°F.

†350 Lbs. Hydraulic Pressure, Non Shock, and a Total Temperature of 450°F.

*700 Lbs. Hydraulic Pressure, Non Shock, and a Total Temperature of 100°F.

†500 Lbs. Hydraulic Pressure, Non Shock, and a Total Temperature of 100°F.

Tested to 1000 Lbs. Hydraulic Shell Test at 100°F. Maximum

Gate Valve, Flanged
Fig. No. 2021Gate Valve, Flanged
with By-Pass (Not Illustrated)
Fig. No. 2023

LIST PRICES

Size.....Inches	1½	2	2½	3	3½	4
Price, Fig. No. 2021.....Each	\$52.50	\$57.50	\$70.00	\$85.00	\$100.00	\$115.00
Center to Face, Flanges.....Inches	3¾	4¼	4¾	5⅞	5⅞	6
Center to Top Stem, Open.....Inches	16½	17⅞	21¾	24⅞	26⅞	29
Size.....Inches	4½	5	6	7	8	10
Price, Fig. No. 2021.....Each	\$130.00	\$145.00	\$170.00	\$210.00	\$245.00	\$375.00
Price, Fig. No. 2023.....Each			225.00	265.00	300.00	440.00
Center to Face, Flanges.....Inches	6⅝	7½	7⅞	8⅞	8¼	9
Center to Top Stem, Open.....Inches	30⅜	35⅜	38⅞	42½	48¼	58⅞
Size.....Inches	12	14	16	18	20	24
Price, Fig. No. 2021.....Each	\$475.00	\$625.00	\$800.00	1115.00	1415.00	2165.00
Price, Fig. No. 2023.....Each	560.00	710.00	885.00	1200.00	1510.00	2260.00
Center to Face, Flanges.....Inches	9⅞	11¼	12	13	14	15½
Center to Top Stem, Open.....Inches	66⅞	77¼	85	97	102½	120½

*When using High Tensile Bolts.

†When using Commercial Bolts.

†Standard practice of manufacturers urges the discontinuance of these sizes which are considered as special.

See pages 304 and 305 for drilling and dimensions of flanges.

List Prices given above are for "Class A"—Monel Trimmed which is the standard trimming; "Class B"—Steel Trimmed; and "Class C"—Bronze Trimmed. These valves can also be furnished in "Class D"—Rustless Steel Trimmed, prices on application.

All Gate Valves have six bosses located one on either side and one underneath just back of each flange. These bosses are suitable for ½-inch by-passes on valves up to 4-inch, 1-inch on valves 5 to 8 inch and 1-inch on larger valves. The bosses may also be used for drains. When by-passes are ordered, they will be furnished built up with screwed valves and fittings.

For List Prices on drilling, see page 342.

Order by Figure Number and Class of Trim.

VALVES

Reading Cast Steel Gate Valves

400 Lbs. W.S.P.—Outside Screw and Yoke

400 Lbs. Steam or Hot Oil Pressure and a Total Temperature of 750°F.
 500 Lbs. Hydraulic Pressure, Non Shock, and a Total Temperature of 450°F.
 750 Lbs. Hydraulic Pressure, Non Shock, and a Total Temperature of 100°F.

Tested to 1000 Lbs. Hydraulic Shell Test at 100°F. Maximum



Gate Valve, Flanged
Fig. No. 4021

Gate Valve, Flanged
with By-Pass (Not Illustrated)
Fig. No. 4023



LIST PRICES

Size.....Inches	1½	2	2½	3	3½	4
Price, Fig. No. 4021.....Each	\$97.00	\$110.00	\$135.00	\$165.00	\$200.00	\$243.00
Center to Face, Flanges.....Inches	4¾	5¾	6½	7	7½	8
Center to Top Stem, Open....Inches	16½	17¾	21¾	24½	26½	29
Size.....Inches	5	6	8	10	12	
Price, Fig. No. 4021.....Each	308.00	380.00	535.00	790.00	1050.00	
Price, Fig. No. 4023.....Each		500.00	655.00	925.00	1240.00	
Center to Face, Flanges.....Inches	9	9¾	11¾	13¼	15	
Center to Top, Stem, Open....Inches	35¾	38¾	48¼	58¾	66¾	
Size.....Inches	14	16	18	20	24	
Price, Fig. No. 4021.....Each	1375.00	1775.00	2350.00	3000.00	4600.00	
Price, Fig. No. 4023.....Each	1565.00	1965.00	2540.00	3200.00	4800.00	
Center to Face, Flanges.....Inches	16¼	17¾	19¼	20¾	24¼	
Center to Top, Stem, Open....Inches	77¼	85	97	102½	120½	

See pages 310 and 311 for drilling and dimensions of flanges.

List Prices given above are for "Class A"—Monel Trimmed which is the standard trimming; "Class B"—Steel Trimmed; and "Class C"—Bronze Trimmed. These valves can also be furnished in "Class D"—Rustless Steel Trimmed, prices on application.

All Gate Valves have six bosses located one on either side and one underneath just back of each flange. These bosses are suitable for ½-inch by-passes on valves up to 4-inch, ¾-inch on valves 5 to 8-inch and 1-inch on larger valves. The bosses may also be used for drains. When by-passes are ordered, they will be furnished built up with screwed valves and fittings.

For List Prices on drilling, see page 342.

Order by Figure Number and Class of Trim.

VALVES

Bronze Quick Operating Gate Valves

Bronze Butterfly Valves



*Standard Gate Valve
125 Lbs. Working Pressure
Screwed—Fig. No. 1399
Flanged (Not Illustrated)—Fig. No. 1400
*“J.M.T.” Medium Gate Valve
200 Lbs. Working Pressure
Screwed—Fig. No. 598
Flanged (Not Illustrated)—Fig. No. 599

Morrison Bronze
Butterfly Valve
Screwed Ends
Fig. No. 537

LIST PRICES, STANDARD GATES—Fig. Nos. 1399, 1400

Size.....Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Screwed, Fig. No. 1399...Each	\$3.50	\$3.60	\$4.80	\$6.20	\$8.50	\$11.80	\$20.25	\$30.00
Flanged, Fig. No. 1400...Each	....	....	12.50	14.50	18.50	29.50	40.00	50.00
Diam. of Flanges.....Inches	....	....	4	$4\frac{1}{2}$	5	6	7	$7\frac{1}{2}$

LIST PRICES, “J.M.T.” GATES—Fig. Nos. 598, 599

Size.....Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Screwed, Fig. No. 598...Each	\$3.50	\$3.60	\$4.80	\$6.20	\$8.50	\$11.80	\$20.25	\$30.00
Flanged, Fig. No. 599...Each	....	....	12.50	14.50	18.50	29.50	40.00	50.00
End to End, Screwed...Inches	$2\frac{1}{2}$	3	$3\frac{1}{2}$	$3\frac{3}{4}$	$4\frac{1}{4}$	$4\frac{3}{4}$	$5\frac{1}{2}$	....
Face to Face, Flanged...Inches	....	....	$4\frac{1}{4}$	$4\frac{3}{4}$	$5\frac{1}{4}$	$6\frac{1}{2}$	$7\frac{1}{4}$	....
Diam. of Flanges.....Inches	....	....	4	$4\frac{1}{2}$	5	6	7	$7\frac{1}{2}$

LIST PRICES, BUTTERFLY VALVES—Fig. No. 537

Size.....Inches	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Screwed.....Each	\$3.10	\$4.40	\$5.65	\$6.75	\$10.00	\$13.75	\$21.00

*The Quick Operating Gate Valves are furnished with rough bodies, finished trimmings, malleable iron levers. These valves are for use where a quick motion is desirable, being operated by a single movement of the lever, and the disc can be locked in any position by the wheel screw.

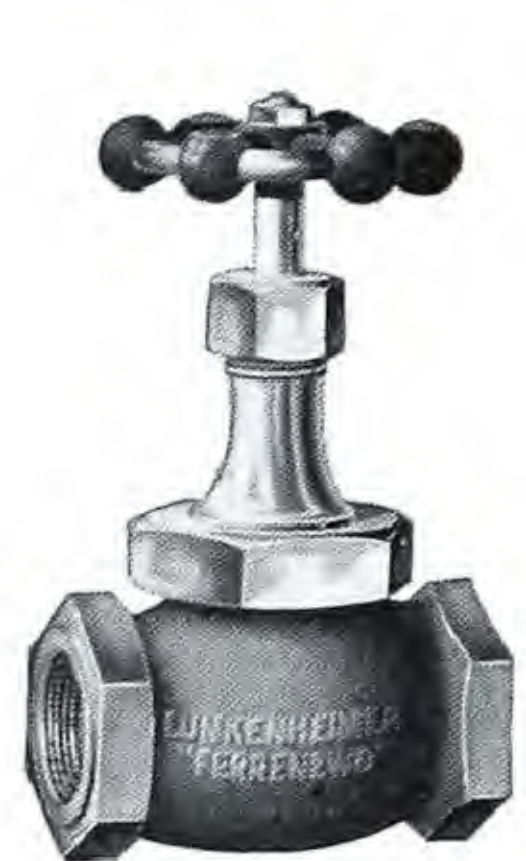
For List Prices on drilling, see page 340.
Order by Figure Number.

VALVES

Lunkenheimer "Ferrenewo" Globe and Angle Valves

Iron Body—Renewable Nickel Seat and Disc—Union Bonnet

For 150 Lbs. Working Steam Pressure



Globe Valve
Fig. No. 1021



Angle Valve
Fig. No. 1022

LIST PRICES—Fig. No. 1021

Size.	Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$
Price	Each	1.10	1.25	1.60	2.20
End to End.	Inches	$2\frac{9}{16}$	$2\frac{11}{16}$	3	$3\frac{9}{16}$
Size.	Inches	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Price	Each	2.80	4.00	5.50	8.75
End to End.	Inches	$4\frac{1}{8}$	$4\frac{3}{4}$	$5\frac{1}{4}$	$6\frac{1}{4}$

LIST PRICES—Fig. No. 1022

Size.	Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$
Price	Each	1.10	1.25	1.60	2.20
Center to End.	Inches	$1\frac{3}{16}$	$1\frac{5}{16}$	$1\frac{7}{16}$	$1\frac{5}{8}$
Size.	Inches	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Price	Each	2.80	4.00	5.50	8.75
Center to End.	Inches	$1\frac{15}{16}$	$2\frac{1}{4}$	$2\frac{7}{16}$	3

Order by Figure Number.

VALVES

*Lunkenheimer "Renewo" Globe and Angle Valves**Bronze—Union Bonnet—Renewable Nickel Seat and Disc**For 200 Lbs. Working Steam Pressure*Globe Valve
Fig. No. 73Angle Valve
Fig. No. 72

LIST PRICES—Fig. No. 73

Size.....Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1
Price.....Each	1.10	1.25	1.60	2.20	2.80
End to End.....Inches	$2\frac{1}{8}$	$2\frac{5}{8}$	$2\frac{5}{8}$	$3\frac{1}{4}$	$3\frac{3}{4}$
Size.....Inches	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Price.....Each	4.00	5.50	8.75	15.75	22.00
End to End.....Inches	$4\frac{1}{4}$	$4\frac{3}{4}$	$5\frac{3}{4}$	$6\frac{13}{16}$	$7\frac{3}{4}$

LIST PRICES—Fig. No. 72

Size.....Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1
Price.....Each	1.10	1.25	1.60	2.20	2.80
Center to End.....Inches	1	$1\frac{1}{16}$	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{11}{16}$
Size.....Inches	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Price.....Each	4.00	5.50	8.75	15.75	22.00
Center to End.....Inches	$1\frac{15}{16}$	$2\frac{3}{16}$	$2\frac{5}{8}$	$3\frac{5}{16}$	$3\frac{13}{16}$

These valves are provided with renewable nickel seats, which can easily be removed when necessary. They will, however, permit of considerable regrinding before it becomes necessary to renew them. It is not necessary to disconnect the valve from the pipe when either regrinding or removing the seat. The discs and all other parts subject to wear can be renewed when worn.

Order by Figure Number.

VALVES



Lunkenheimer Needle Valves

* Bronze or Steel Stem

200 Lbs. Working Pressure



Globe, Without Union—Fig. No. 906

Angle, Without Union (Not Ill.)

Fig. No. 907

Globe, With Union—Fig. No. 909

Angle, With Union (Not Ill.)

Fig. No. 910

LIST PRICES—Fig. Nos. 906, 907, 909, 910

Size.....Inches	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$
*Price, Globe, Fig. No. 906.....Each	2.40	2.50	2.80	3.50
*Price, Angle, Fig. No. 907.....Each	2.50	2.65	3.00	3.80
Price, Globe, Fig. No. 909.....Each	3.50	3.80	4.50	6.50
Price, Angle, Fig. No. 910.....Each	3.60	4.00	4.75	6.80
End to End, Globe Valves.....Inches	$1\frac{5}{8}$	$1\frac{5}{8}$	$1\frac{13}{16}$	$2\frac{1}{8}$
Center to End, Angle Valves.....Inches	$\frac{3}{4}$	$\frac{13}{16}$	$\frac{15}{16}$	$1\frac{1}{16}$

Valves with Steel Stem have smaller seat opening, providing finer regulation.

*Unless otherwise specified, valves will be furnished with bronze stem. Fig. Nos. 906 and 907 can be furnished with steel stem at slight additional cost.

Lunkenheimer "Gland Type" Needle Valves

Bronze Stem Only

All 1-inch Needle Valves have
Union Bonnet Construction

200 Lbs. Working Pressure



Globe—Fig. No. 1205

Angle (Not Ill.)—Fig. No. 1206

Angle—Fig. No. 1568

Globe (Not Ill.)—Fig. No. 1567

LIST PRICES—Fig. Nos. 1205, 1206, 1567, 1568

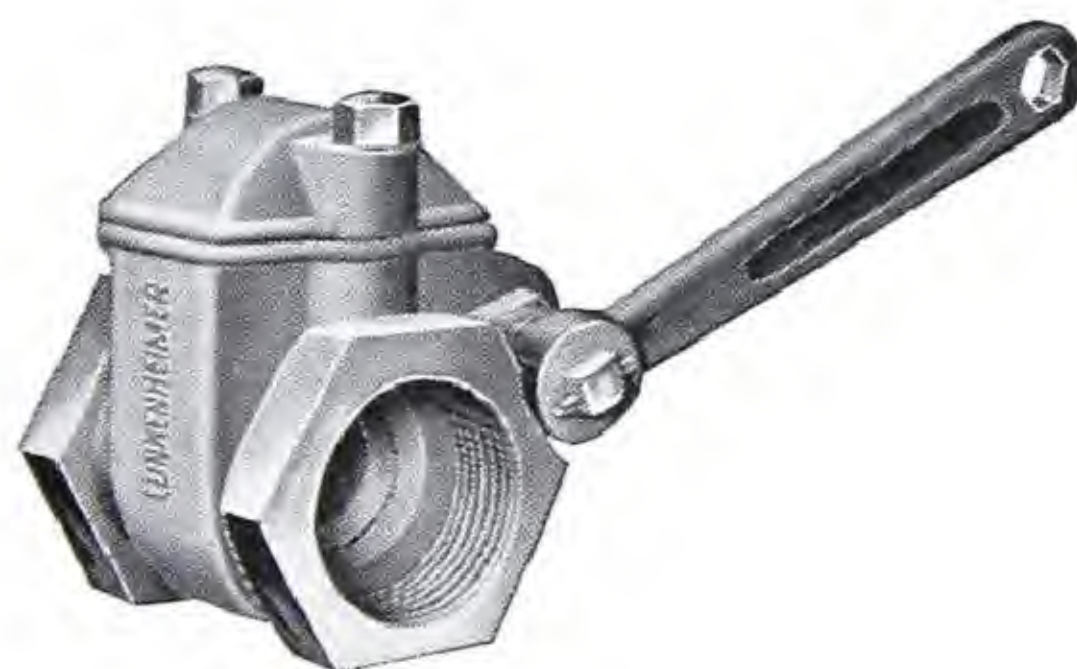
Size.....Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1
Price, Globe, Fig. No. 1205.....Each	3.00	3.30	4.00	5.50	9.00
Price, Angle, Fig. No. 1206.....Each	3.15	3.50	4.40	6.00	9.50
Price, Globe, Fig. No. 1567.....Each	7.00	8.00	....	....	....
Price, Angle, Fig. No. 1568.....Each	7.25	8.30	....	....	....
End to End Globe Valves.....Inches	$1\frac{5}{8}$	$1\frac{13}{16}$	$2\frac{1}{8}$	$2\frac{9}{16}$	$3\frac{3}{8}$
Center to End, Angle Valves.....Inches	$\frac{13}{16}$	$\frac{15}{16}$	$1\frac{1}{16}$	$1\frac{5}{16}$	$1\frac{5}{8}$
Center to End of Union, Globe Valves Inches	$1\frac{5}{8}$	$1\frac{3}{4}$	....	....	....
Center to End of Union, Angle Valves Inches	$1\frac{5}{8}$	$1\frac{3}{4}$	....	....	....

Order by Figure Number.

VALVES

*Lunkenheimer "Handy" Gate Valves**All Iron—Iron Body, Bronze Mounted—Bronze**75 Lbs. Steam Pressure*All Iron
Fig. No. 322

The "Handy" Gate Valve is designed for Low Pressure Steam, Water, Gas, Oil Services, etc. For use in Refineries, Pulp Mills, Tanneries, Soap and Varnish Works, Lead Works, Canning and Packing Establishments. The All Iron, Fig. No. 322, is suitable for Cyanides, Creosotes, Alkaline Solutions, etc.

Iron Body, Bronze Mounted
Fig. No. 628Bronze
Fig. No. 430

LIST PRICES

Size.....Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$
Fig. No. 322.....Each	....	4.80	5.00	5.50	6.00	7.00	12.00
Fig. No. 628.....Each	....	....	....	....	....	7.00	12.00
Fig. No. 430.....Each	1.60	1.80	2.50	3.50	5.00	7.50	13.50
Fig. Nos. 322, 628, End to End Inches	....	$2\frac{1}{4}$	$2\frac{3}{4}$	$2\frac{3}{4}$	$3\frac{1}{8}$	$4\frac{1}{4}$	$4\frac{1}{2}$
Fig. No. 430, End to End.....Inches	2	$2\frac{1}{8}$	$2\frac{3}{8}$	$2\frac{9}{16}$	$2\frac{7}{8}$	$3\frac{1}{8}$	$3\frac{5}{8}$

Size.....Inches	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	6	8
Fig. No. 322.....Each	15.00	18.00	21.00	25.00	30.00	42.00	90.00
Fig. No. 628.....Each	15.00	18.00	21.00	25.00	30.00	42.00	90.00
Fig. No. 430.....Each	19.00	40.00	60.00	....	....	....	....
Fig. Nos. 322, 628, End to End Inches	5	$6\frac{1}{8}$	$6\frac{3}{8}$	$6\frac{1}{2}$	$7\frac{5}{8}$	$8\frac{1}{4}$	$9\frac{3}{4}$
Fig. No. 430, End to End.....Inches	$3\frac{7}{8}$	$5\frac{7}{8}$	$5\frac{15}{16}$	....	....	....	....

Order by Figure Number.

VALVES

*Lunkenheimer Heavy Lever Throttle Valves**Bronze—Iron Body—Bronze Mounted*

Sizes 1-2 to 3-inch, 175 Lbs. Working Steam Pressure
 Sizes 3 1-2 and 4-inch, 125 Lbs. Working Steam Pressure
 Sizes 5 and 6-inch, 100 Lbs. Working Steam Pressure



Bronze
 Fig. No. 431



Iron Body—Bronze Mounted
 Fig. No. 432

LIST PRICES

Size.....Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Fig. No. 431.....Each	2.50	3.00	4.00	5.00	7.00	10.00
Fig. No. 432.....Each	.....	.....	.....	.....	.....	8.50
Fig. No. 431 End to End.....Inches	$2\frac{5}{16}$	$2\frac{9}{16}$	$2\frac{15}{16}$	$3\frac{1}{4}$	$3\frac{9}{16}$	$4\frac{1}{16}$
Fig. No. 432 End to End.....Inches	.....	.....	.....	.....	.....	$5\frac{1}{2}$
Size.....Inches	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	5	6
Fig. No. 431.....Each	19.00	.....	.....	.....	.....	.....
Fig. No. 432.....Each	16.00	20.00	25.00	30.00	35.00	40.00
Fig. No. 431 End to End.....Inches	$5\frac{3}{16}$	.....	.....	.....	.....	.....
Fig. No. 432 End to End.....Inches	$6\frac{3}{8}$	$6\frac{1}{4}$	$6\frac{3}{4}$	$7\frac{1}{4}$	$8\frac{1}{2}$	$9\frac{1}{4}$

These valves are extensively used as a "throttle" for steam traction, hoisting and road engines and many allied services.

Order by Figure Number.

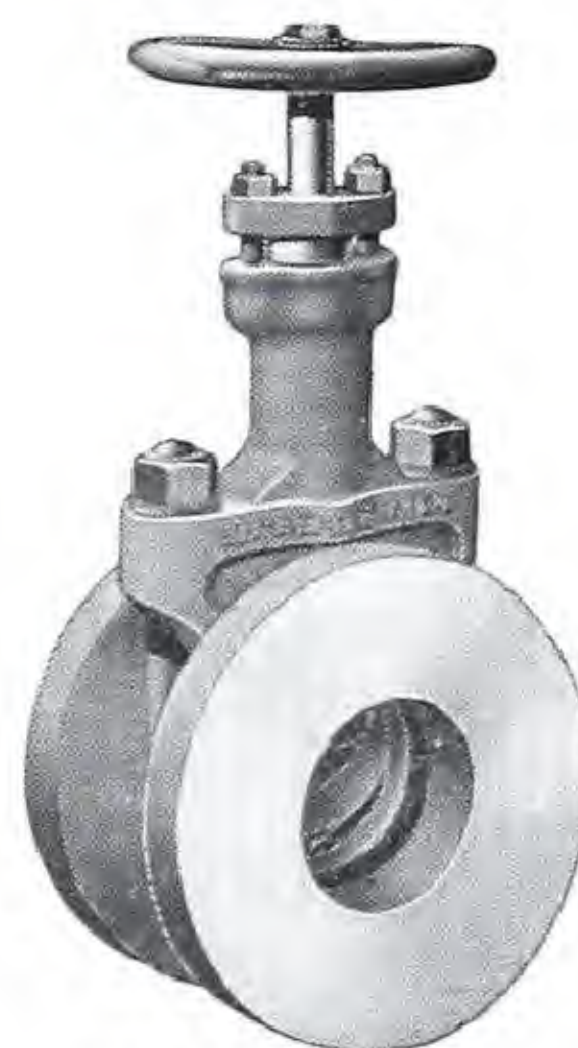
VALVES

*Lunkenheimer "Clip" Gate Valves**All Iron, and Iron Body—Bronze Mounted**Inside Screw**Rising Stem**For 100 Lbs. Working Steam Pressure*

"Clip" Gate Valve
Iron Body—Bronze Mounted
Fig. No. 600



"Clip" Gate Valve
All Iron
Fig. No. 319



"Clip" Gate Valve
Iron Body—Bronze Mounted
Fig. No. 638

LIST PRICES

Size.....Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$
Fig. No. 600.....Each	2.00	2.35	2.50	3.50
Fig. No. 319.....Each	2.00	2.35	2.50	3.50
Fig. No. 638.....Each	....	....	3.00	4.90
Fig. No. 600, End to End.....Inches	2	$2\frac{5}{16}$	$2\frac{1}{2}$	$2\frac{3}{4}$
Fig. No. 319, End to End.....Inches	2	$2\frac{5}{16}$	$2\frac{1}{2}$	$2\frac{3}{4}$
Fig. No. 638, Face to Face.....Inches	....	....	$3\frac{3}{16}$	$3\frac{1}{2}$
Fig. No. 638, Diameter of Flanges Inches	....	....	4	$4\frac{1}{2}$
Size.....Inches	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Fig. No. 600.....Each	5.00	7.50	12.00	15.00
Fig. No. 319.....Each	5.00	7.50	12.00	15.00
Fig. No. 638.....Each	6.00	8.50	13.50	16.90
Fig. No. 600, End to End.....Inches	$3\frac{1}{8}$	$3\frac{1}{2}$	4	$4\frac{3}{8}$
Fig. No. 319, End to End.....Inches	$3\frac{1}{8}$	$3\frac{1}{2}$	4	$4\frac{3}{8}$
Fig. No. 638, Face to Face.....Inches	$3\frac{3}{4}$	4	$4\frac{5}{16}$	$5\frac{1}{8}$
Fig. No. 638, Diameter of Flanges Inches	5	6	7	$7\frac{1}{2}$

For List Prices on drilling, see page 340.
Order by Figure Number.

VALVES

Standard Iron Foot Valves

Leather Disc

Style 3/4 to 6-inch

With Strainer

Style 7 to 16-inch

Foot Valve, With Strainer
Screwed—Fig. No. 1451
Flanged (Not Ill.)
Fig. No. 1452



Iron Strainer
Male or Female Thread
Fig. No. 1453

LIST PRICES—Fig. Nos. 1451, 1452

Size.....Inches	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4
Price, Screwed, Painted.....Each	1.15	1.30	1.40	1.90	2.40	3.30	3.90	5.60	7.30
Price, Screwed, Galvanized...Each	1.75	2.00	2.10	2.85	3.60	5.00	5.75	8.50	11.00
Price, Flanged, Painted.....Each	.....	.....	.....	.....	3.50	4.50	5.75	7.50	9.50
Price, Flanged, Galvanized...Each	.....	.....	.....	.....	5.50	7.00	9.00	12.00	15.00
Diameter of Flanges.....Inches	.....	.....	.....	.....	6	7	$7\frac{1}{2}$	$8\frac{1}{2}$	9

Size.....Inches	$4\frac{1}{2}$	5	6	7	8	10	12	14	16
Price, Screwed, Painted.....Each	10.50	11.25	14.75	35.00	41.00	64.00	100.00	.....	.....
Price, Screwed, Galvanized...Each	15.75	16.75	22.00	53.00	62.00	110.00	155.00	.....	.....
Price, Flanged, Painted.....Each	13.00	14.00	17.50	38.00	45.00	70.00	112.00	150.00	200.00
Price, Flanged, Galvanized...Each	20.00	22.00	27.00	57.00	72.00	120.00	170.00	.....	.....
Diameter of Flanges.....Inches	$9\frac{1}{4}$	10	11	$12\frac{1}{2}$	$13\frac{1}{2}$	16	19	21	$23\frac{1}{2}$

LIST PRICES—Fig. Nos. 1453

Size.....Inches	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Price, Painted.....Each	.30	.40	.50	.75	1.00	1.50	2.00
Price, Galvanized.....Each	.40	.50	.75	1.00	1.50	2.00	3.00

Size.....Inches	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	6	8	.....
Price, Painted.....Each	3.00	3.75	4.75	4.75	6.50	15.00	.....
Price, Galvanized.....Each	4.50	6.00	7.00	7.00	10.00	20.00	.....

Brass Foot Valves furnished from Cast Iron Pattern, when so desired, at special net prices.
Foot Valves 7-inch and up furnished with brass disc and brass seat at special prices.
Order by Figure Number.

VALVES Foot Valves and Strainers Long Pattern



Iron Body Foot Valve
Screwed—Fig. No. 1454

Sectional View

Brass Foot Valve
Screwed—Fig. No. 1456

Flanged (Not Ill.)—Fig. No. 1455

LIST PRICES—Fig. No. 1454

Size.....Inches	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$
Price, Painted ....Each	1.15	1.30	1.40	1.90	2.40	3.30	3.90	5.60
Price, Galvanized .Each	1.75	1.95	2.10	2.85	3.60	4.95	5.85	8.40

Size.....Inches	4	$4\frac{1}{2}$	5	6	7	8	10	.....
Price, Painted ....Each	7.30	10.50	11.25	14.75	35.00	41.00	64.00	.....
Price, Galvanized .Each	10.95	15.75	16.90	22.15	52.50	61.50	96.00	.....

LIST PRICES—Fig. No. 1455

Size.....Inches	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$
Price, Painted ....Each	3.50	4.50	5.75	7.50	9.50	13.00
Price, Galvanized ....Each	5.25	6.75	8.65	11.25	14.25	19.50
Diameter of Flanges ..Inches	6	7	$7\frac{1}{2}$	$8\frac{1}{2}$	9	$9\frac{1}{4}$

Size.....Inches	5	6	7	8	10	.....
Price, Painted ....Each	14.00	17.50	39.00	45.00	70.00	.....
Price, Galvanized ....Each	21.00	26.25	58.00	67.50	105.00	.....
Diameter of Flanges .Inches	10	11	$12\frac{1}{2}$	$13\frac{1}{2}$	16	.....

LIST PRICES—Fig. No. 1456

Size.....Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$
Price.....Each	1.50	1.50	2.00	2.75	3.75

Size.....Inches	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4
Price.....Each	5.50	12.00	16.00	30.00	35.00

Iron body foot valves sizes $\frac{3}{4}$ to 4-inch are furnished with brass disc. Larger sizes are furnished with leather disc unless otherwise specified.

Order by Figure Number.

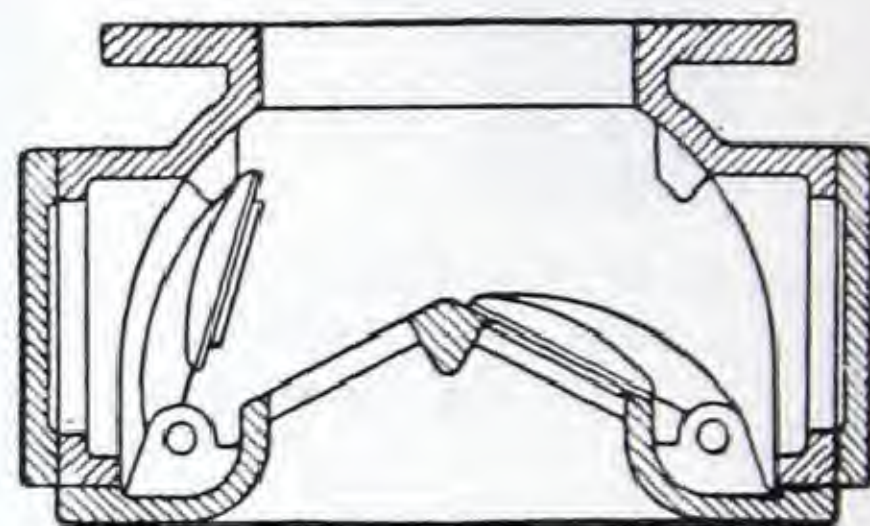
VALVES

*Buffalo Underwriter Foot Valves**Iron Body—Bronze Mounted—Rubber Faced Hinged Valves*

100-125 Lbs. Pressure



Outside View



Sectional View

Flanged—Fig. No. 1150

LIST PRICES, DIMENSIONS, ETC.

Size.....Inches	6	8	10	12
Price.....Each	\$50.00	\$70.00	\$110.00	\$135.00
Length over all.....Inches	8 $\frac{1}{8}$	9 $\frac{3}{4}$	11 $\frac{3}{4}$	13 $\frac{1}{4}$
Greatest outside diameter.....Inches	15 $\frac{1}{4}$	18 $\frac{1}{4}$	21 $\frac{1}{4}$	26 $\frac{1}{2}$
Diameter of Pipe Flange.....Inches	11	13 $\frac{1}{2}$	16	19
Number of Valves.....Each	2	2	2	2
Number of Hand Holes.....Each	2	2	2	2
Valve area.....Square Inches	37.4	64	95	145
Percent of Pipe Area.....	132	127	121	129
Weight, Each.....Pounds	120	170	280	340

Size.....Inches	14	15	18	20
Price.....Each	\$200.00	\$215.00	\$450.00	\$500.00
Length over all.....Inches	14 $\frac{3}{4}$	14 $\frac{3}{4}$	20	20
Greatest Outside Diameter.....Inches	28	28	39	39
Diameter of Pipe Flange.....Inches	21	22 $\frac{1}{4}$	25	27 $\frac{1}{2}$
Number of Valves.....Each	3	3	4	4
Number of Hand Holes.....Each	3	3	4	4
Valve area.....Square Inches	195	195	350	350
Percent of Pipe Area.....	128	110	138	111
Weight Each.....Pounds	525	550	1,400	1,450

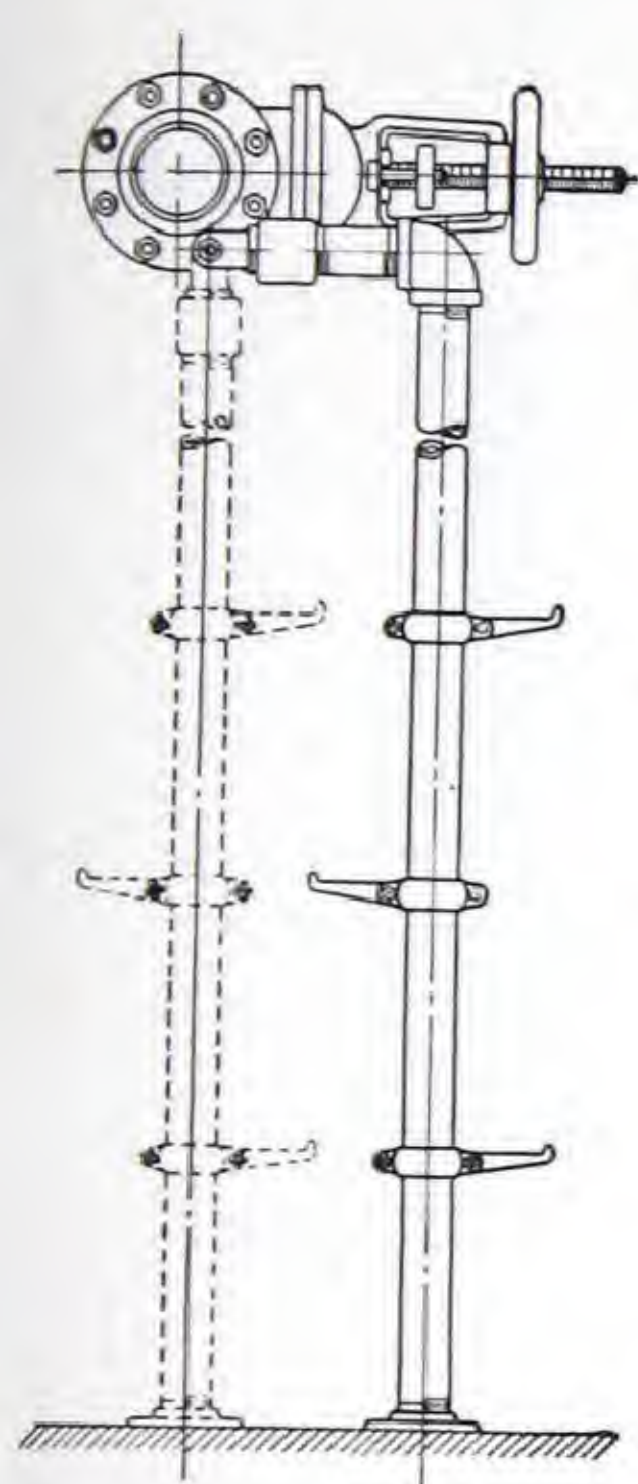
For use on suction lines of steam and centrifugal Underwriter Fire Pumps to retain water, avoiding necessity of repeated priming.

Buffalo Underwriter Foot Valves fully meet Underwriter requirements.

Strainer not permitted by Underwriters.

Order by Figure Number.

VALVE ACCESSORIES

*Pipe Pole Ladder Connection and Riser Steps**Malleable Iron*

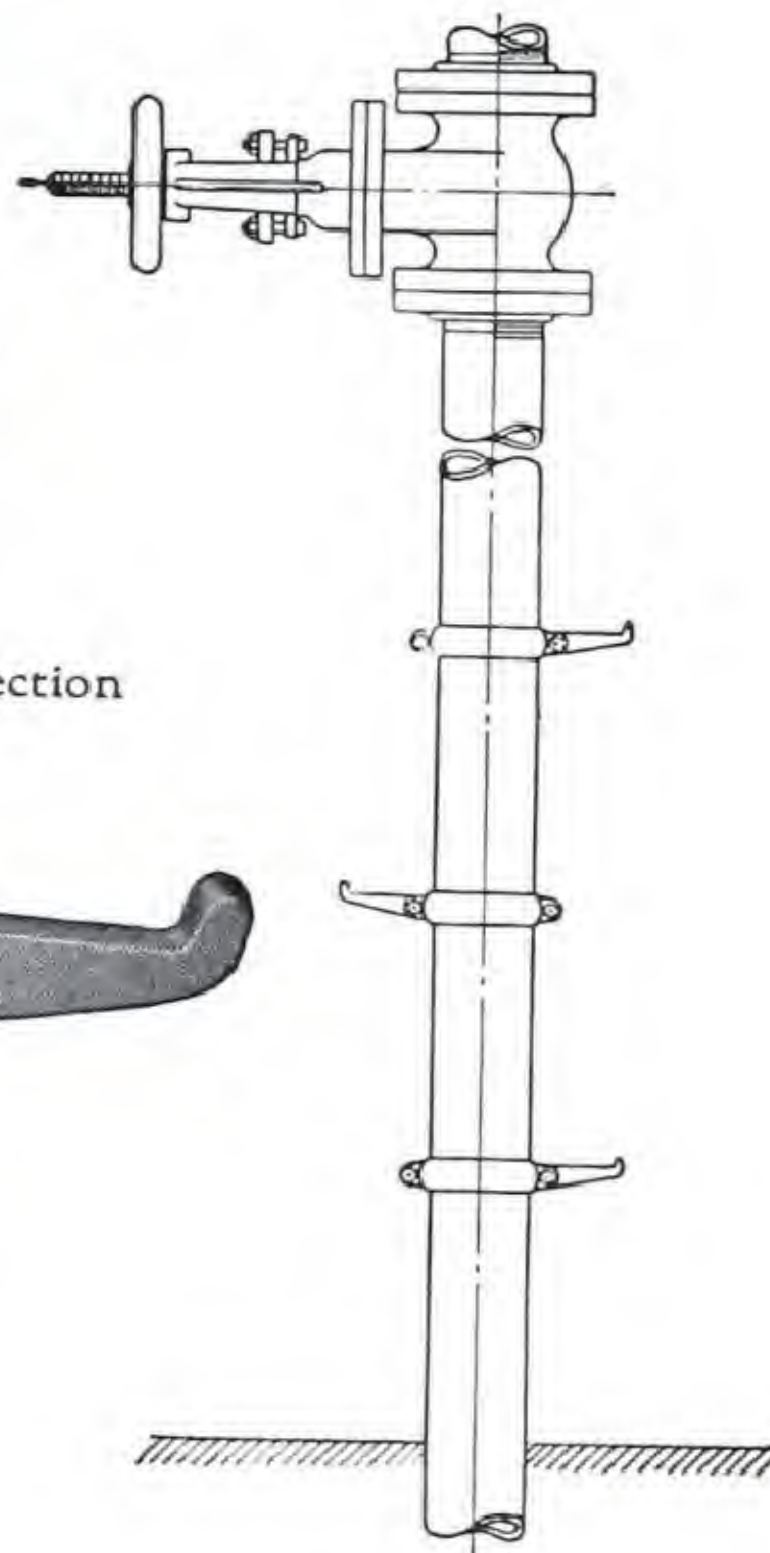
2" Pipe Pole Ladder, Using
Pipe Pole Ladder Connection
and 2" Riser Steps



2" Pipe Pole Ladder Connection
Fig. No. 1460



Riser Steps
Fig. No. 1461



Riser Steps
on Main Riser

RISER STEPS—Fig. No. 1461

Size.....Inches	2	2½	3	3½	4	5	6
Price.....Each	.40	.45	.50	.60	.70	.75	.80

PIPE POLE LADDER CONNECTION—Fig. No. 1460

Made in 2-inch Size only. List Price Each \$1.30

Riser Steps are furnished in sizes 2-inch to 6-inch. The convenience their installation affords in reaching valves located at some distance from the floor can easily be appreciated.

The Pipe Pole Connection provides a means of attachment when it is desired to use riser steps on a separate 2-inch pipe pole as illustrated above. Order by Figure Number.

VALVE ACCESSORIES
Babbitt Adjustable Sprocket Rims
 With Chain Guide

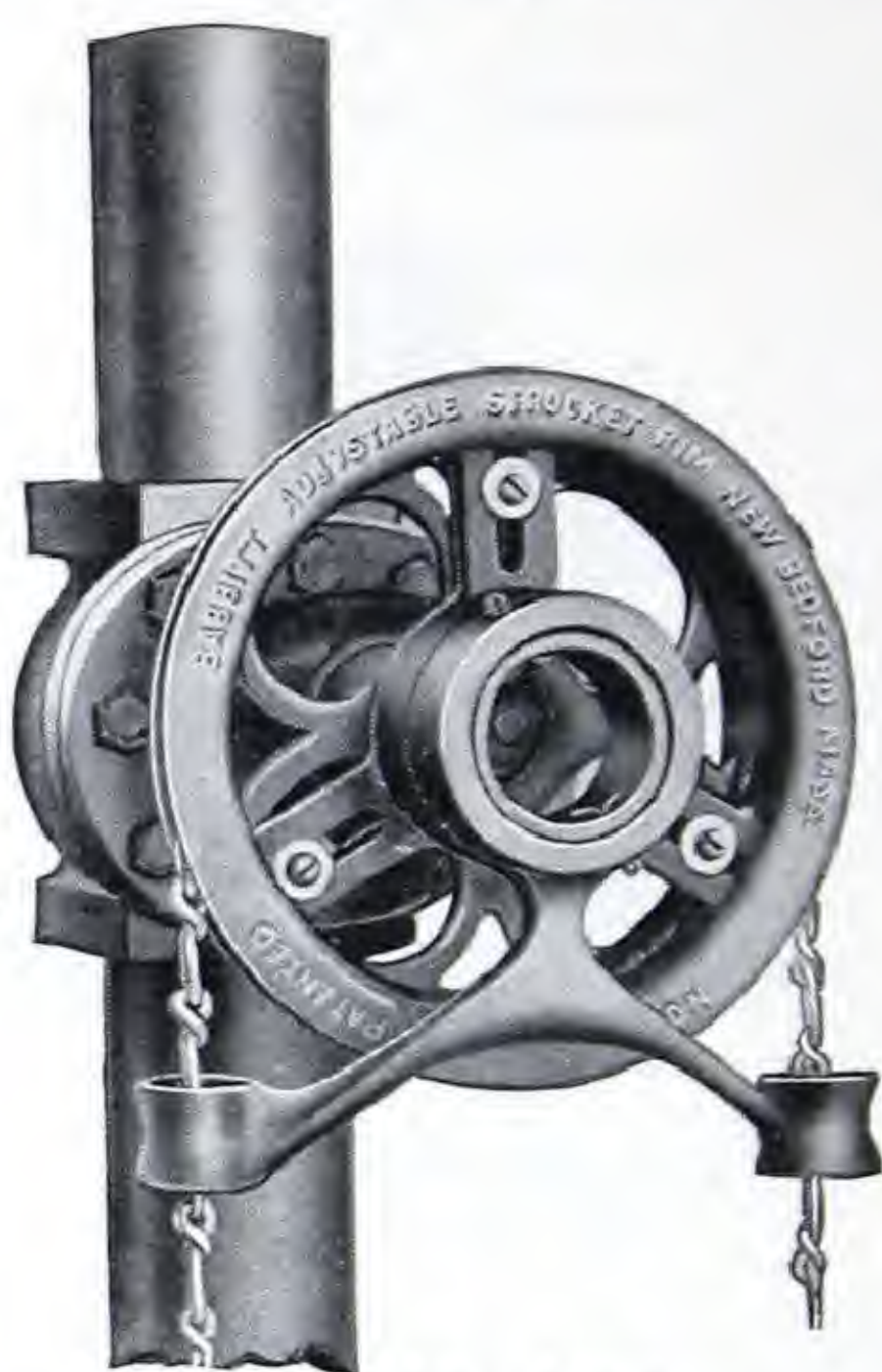


Fig. No. 1467

LIST PRICES

Size No.	List Price of Rim and Guide Combined	Rustproof Chain per Foot	Diameter of Sprocket Wheel Inches	Diameter of Valve Wheels Rim will Fit
0	\$2.40	\$0.10½	4	2 to 3¾
1	4.00	.14	5⅞	4 to 5¾
1½	5.20	.14	7½	5¾ to 7¼
2	6.40	.14	9	7½ to 8¾
2½	8.80	.22	12½	9 to 12¼
3	10.80	.22	15½	12½ to 15¼
3½	15.20	.22	19	15½ to 18¾
4	20.00	.37	22	19 to 21¾
4½	28.00	.37	26	22 to 25¾
5	32.00	.37	30	26 to 30

There are only ten sizes of Babbitt Rims. Out of these ten sizes there is one that will fit any valve in your plant. They are adjustable and may be quickly attached to any type of valve wheel, on any valve, used for any purpose, and does not interfere in any way with the rising stems. The chain guide prevents the chain from jumping off. When ordering, give the diameter of the valve wheel to be fitted and number of feet of chain required.

Order by Figure and Size Numbers.

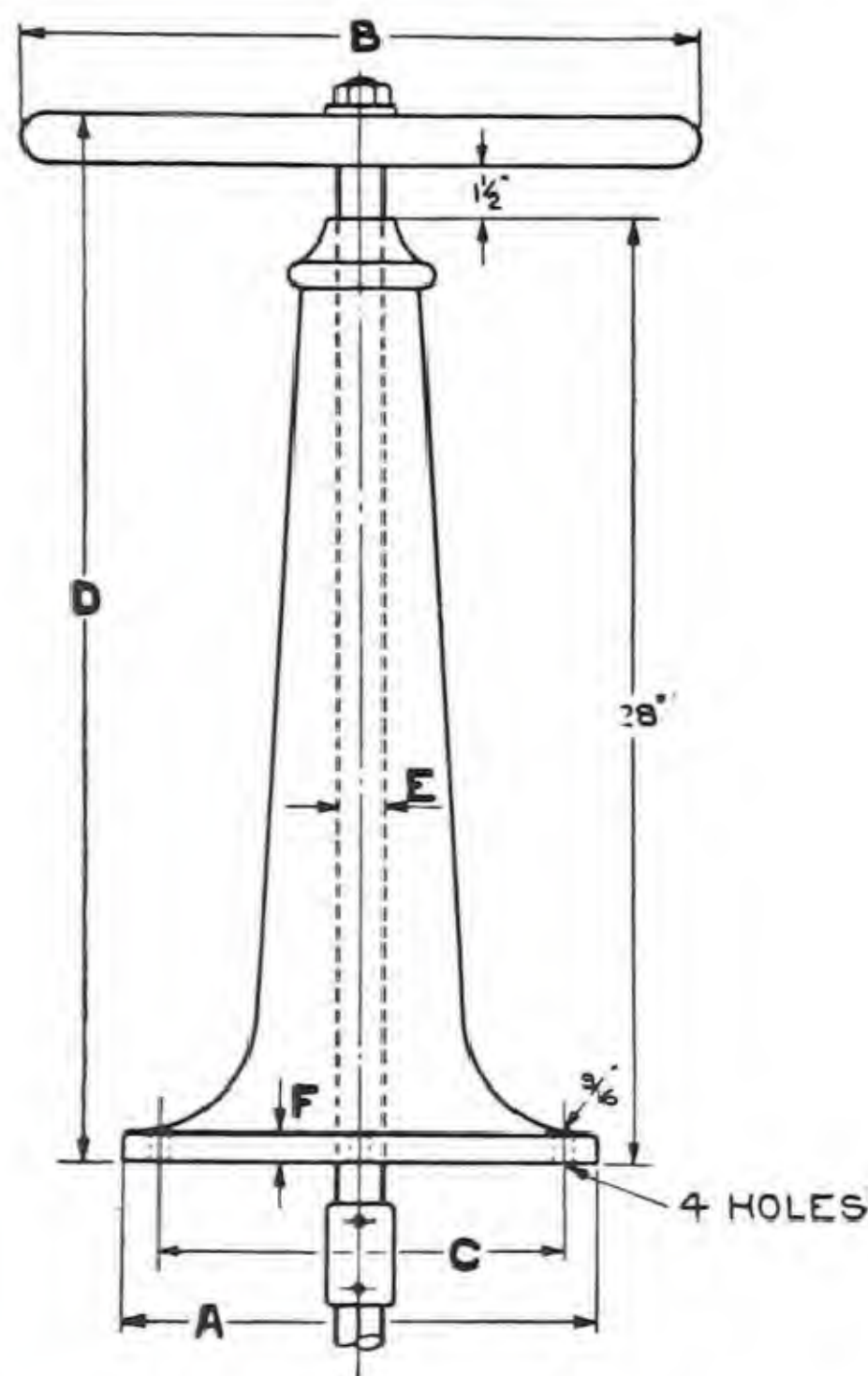
VALVE ACCESSORIES

Grinnell Floor Stands for Valves

Cast Iron



Grinnell Floor Stand
Fig. No. 1462



Grinnell Floor Stands are regularly furnished unfinished and with unfinished wheels. They can be furnished with finished wheels at an extra charge.

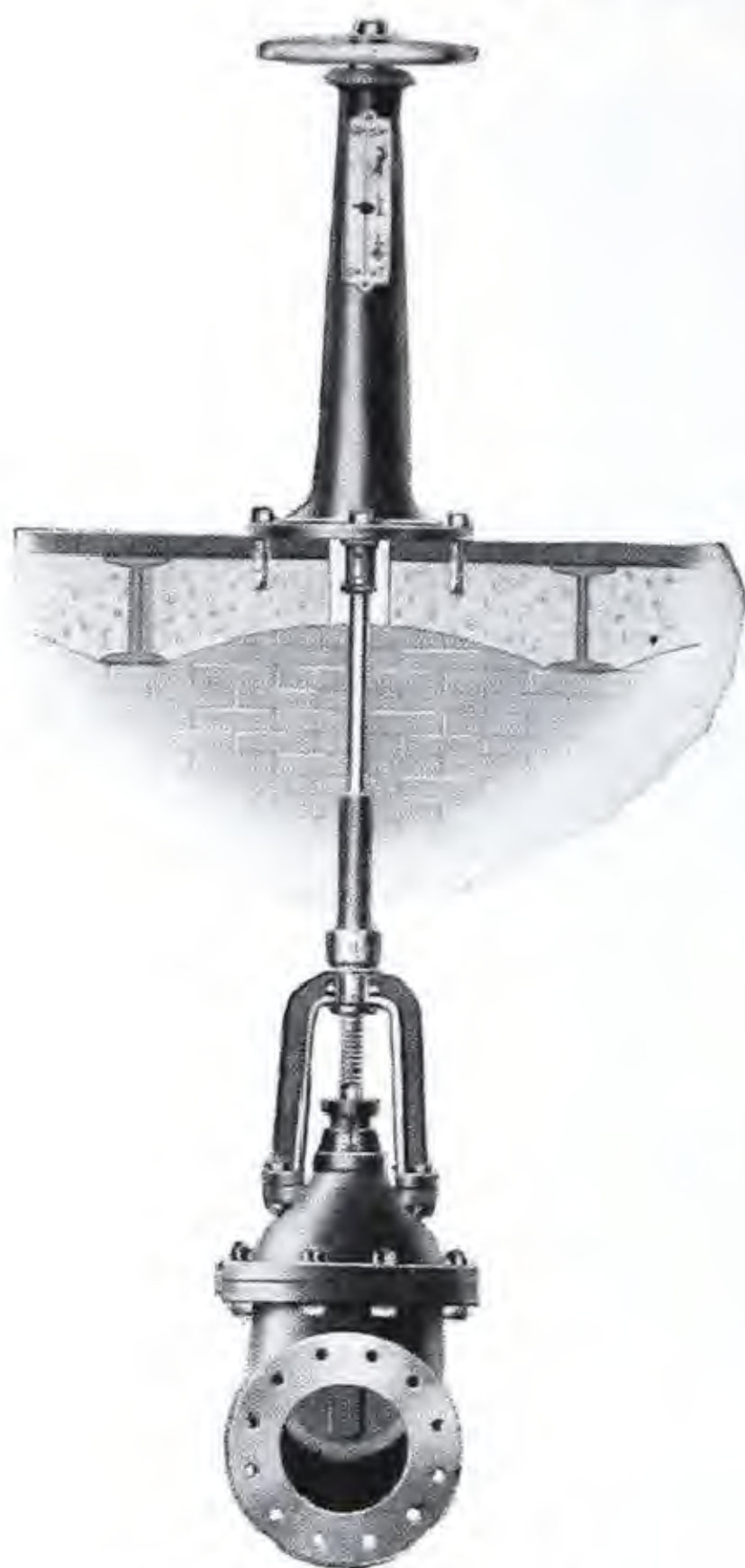
List prices given below include only the iron base and wheel, as the length of stem and the kind of coupling or connection at each valve vary with each installation.

When ordering, give complete information in detail regarding length of stem and the size and manner of connection at the valve.

Size of Valve Inches	Price Each	A	B	C	Minimum D	E	F
2 to 4 1/2	\$30.00	9 1/2	10	8 1/4	30 3/8	1	5/8
5 to 10	35.00	12	16	10 5/8	30 3/4	1 1/8	3/4
12 to 18	40.00	14	20	11 7/8	31	1 1/4	7/8

Order by Figure Number.

VALVE ACCESSORIES

*Jenkins Floor Stands for Valves**Cast Iron*

Jenkins Floor Stand
with Indicator Attachment
Fig. No. 391

Jenkins Floor Stands are cast iron. They are made with various finishes and are suitable for stationary or rising spindle valves of either standard, medium or extra heavy patterns.

Prices will be furnished on application.

Extra charge for stems or spindles according to length, size or style of valve.

STANDS WITHOUT INDICATOR ATTACHMENTS

- Fig. No. 390. Painted column and japanned wheel.
 Fig. No. 392. Finished column and japanned wheel.
 Fig. No. 394. Finished column, rim and hub of wheel finished and spokes japanned.

STANDS WITH INDICATOR ATTACHMENTS

- Fig. No. 391. Painted column and japanned wheel.
 Fig. No. 393. Finished column and japanned wheel.
 Fig. No. 395. Finished column, rim and hub of wheel finished and spokes japanned.

Order by Figure Number.

VALVE ACCESSORIES

*Jenkins Extension Valve Boxes**Cast Iron*

Fig. No. 414

These boxes are made adjustable so that the top may be brought exactly flush with the ground.

When ordering state size of valve and depth of trench, also state what marking is desired upon the cover.

Prices furnished on application.

Order by Figure Number.

VALVE ACCESSORIES

Roadway Boxes

Cast Iron



Roadway Box, Plug Cover
with Flange Base
Fig. No. 1674



Roadway Box, Lock Cover
with Open Base
Fig. No. 1675



Extension
Piece
Fig. No. 1677



Roadway Box, Square Cover
with Open or Flange Base
Fig. No. 1676

These boxes are made adjustable so that the top may be brought exactly flush with the ground.

When ordering specify whether covers are wanted marked "Water" or "Gas." Also state size of valve and depth of trench.

Prices furnished on application.

Order by Figure Number.

VALVE ACCESSORIES

Screw-Type Adjustable Valve Boxes

Cast Iron



Screw-Type Adjustable Valve Box
5 1/4-inch Shaft—Fig. No. 1678
7-inch Shaft—Fig. No. 1680



Covers
For 5 1/4-inch
and 7-inch
Valve Boxes



Extension Piece
For Valve Box
5 1/4-inch Shaft—Fig. No. 1679
7-inch Shaft—Fig. No. 1681

These boxes are made adjustable so that the top may be brought flush with the ground.

When ordering specify whether covers are wanted marked "Water" or "Gas." Also state size of valve and depth of trench.

Prices furnished on application.

Order by Figure Number.

BLOW-OFF VALVES

Jenkins Brass Y or Blow-Off Valves

With Renewable Seat Rings

Standard

150 Lbs. Steam Pressure

250 Lbs. Water Pressure



Standard, Screwed

Fig. No. 124

Extra Heavy, Screwed

Fig. No. 134

Extra Heavy

250 Lbs. Steam Pressure

400 Lbs. Water Pressure



Standard, Flanged

Fig. No. 125

Extra Heavy, Flanged

Fig. No. 135

LIST PRICES—Fig. Nos. 124, 125

Size.....Inches	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Price, Screwed.....Each	2.00	2.00	3.00	4.00	5.00	6.50	9.25	18.00	25.00
Price, Flanged.....Each	...	5.00	7.00	9.00	11.00	13.00	20.00	28.00	37.00
End to End, Screwed.....Inches	$2\frac{1}{8}$	$3\frac{1}{8}$	$3\frac{3}{8}$	$4\frac{1}{4}$	$4\frac{1}{4}$	$5\frac{1}{4}$	$6\frac{5}{8}$	$7\frac{11}{16}$	$9\frac{1}{4}$
Face to Face, Flanged.....Inches	...	$4\frac{1}{4}$	$4\frac{3}{4}$	$5\frac{1}{4}$	6	$6\frac{1}{2}$	$8\frac{1}{8}$	9	11
Diameter of Flanges.....Inches	...	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	6	7	$7\frac{1}{2}$

LIST PRICES—Fig. Nos. 134, 135

Size.....Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Price, Screwed.....Each	4.50	6.00	8.00	10.00	13.00	19.00	36.00	46.00
Price, Flanged.....Each	6.50	8.00	11.00	14.00	18.00	28.00	50.00	60.00
End to End, Screwed.....Inches	$3\frac{1}{2}$	$4\frac{1}{4}$	$4\frac{7}{8}$	$5\frac{5}{8}$	$6\frac{3}{4}$	$7\frac{3}{8}$	$9\frac{1}{4}$	$10\frac{3}{8}$
Face to Face, Flanged.....Inches	$4\frac{3}{8}$	5	$5\frac{5}{8}$	$6\frac{3}{8}$	$7\frac{1}{4}$	$8\frac{3}{4}$	$10\frac{1}{2}$	$11\frac{3}{4}$
Diameter of Flanges.....Inches	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	6	$6\frac{1}{2}$	$7\frac{1}{2}$	$8\frac{1}{4}$

For List Prices on drilling see:—Standard, page 340; Extra Heavy, page 341.
Order by Figure Number.

BLOW-OFF VALVES

*Jenkins Iron Body Y or Blow-Off Valves**With Renewable Seat Rings***Standard**

150 Lbs. Steam Pressure

250 Lbs. Water Pressure



Standard, Screwed

Fig. No. 296

Extra Heavy, Screwed

Fig. No. 336

Extra Heavy

250 Lbs. Steam Pressure

400 Lbs. Water Pressure



Standard, Flanged

Fig. No. 297

Extra Heavy, Flanged

Fig. No. 337

LIST PRICES—Fig. Nos. 296, 297

Size.....Inches	2	2½	3
Price, Screwed.....Each	\$11.00	\$15.00	\$20.00
Price, Flanged.....Each	13.00	18.00	23.00
End to End, Screwed.....Inches	8	9½	11½
Face to Face, Flanged.....Inches	9½	11	12½
Diameter of Flanges.....Inches	6	7	7½

LIST PRICES—Fig. Nos. 336, 337

Size.....Inches	2	2½	3
Price, Screwed.....Each	\$16.00	\$20.00	\$26.00
Price, Flanged.....Each	18.00	24.00	32.00
End to End, Screwed.....Inches	9	10⅝	12
Face to Face, Flanged.....Inches	10¾	12½	14
Diameter of Flanges.....Inches	6½	7½	8¼

For List Prices on drilling see:—Standard, page 340; Extra Heavy, page 341.

Order by Figure Number.

BLOW-OFF VALVES

*Lunkenheimer "Duro" Blow-off Valves**Iron Body—Bronze Mounted**For Working Pressure up to 250 Lbs.*Screwed
Fig. No. 896Flanged
Fig. No. 897

LIST PRICES

Size..... Inches		1¼	1½	2	2½
Screwed Fig. No. 896	{ With Alloy Disc Faces, Bronze Seat and Seat Bushing...Each	10.70	12.50	16.00	21.00
	{ With Solid Monel Disc, Seat and Seat Bushing.....Each	13.20	15.50	19.50	25.50
Flanged Fig. No. 897	{ With Alloy Disc Faces, Bronze Seat and Seat Bushing...Each	12.00	14.00	18.00	23.00
	{ With Solid Monel Disc, Seat and Seat Bushing.....Each	14.50	17.00	21.50	27.50
Center to End, Screwed.....Inches		2⅝	2⅞	4⅛	4¾
Center to Face, Flanged.....Inches		3⅜	4	4⅝	5¼
Diameter of Flanges.....Inches		5	6	6½	7½

Strong and massive in appearance, Lunkenheimer "Duro" Blow-off Valves convey at a glance their particular adaptability to the extremely severe usage to which valves of this kind are subjected. It is universally conceded that they are the best and most substantial valves on the market for working pressures up to 250 pounds.

For List Prices on drilling, see page 341.

Order by Figure Number.

BLOW-OFF VALVES

*Everlasting Blow-off Valves**Straight Through**250 Lbs. Working Steam Pressure*

Fig. No. 1470

The Everlasting Valve, while designed primarily for Blow-off Service is used largely in paper and pulp mills, in rubber and soap works and galvanizing plants, where its non-clogging as well as its self-cleaning features have made it desirable. It is also widely used as a quick-opening throttle valve.

When ordering please specify service in which valve is to be used.

LIST PRICES

Size.....Inches	1	1¼	1½
Iron Body, Screwed.....Each	\$11.00	\$16.00	\$22.00
Iron Body, Flanged.....Each	15.00	19.00	26.00

Size.....Inches	2	2½	3	4	5	6
Iron Body, Screwed.....Each	\$25.00	32.00	44.00	70.00	.....	.....
Iron Body, Flanged.....Each	30.00	39.00	50.00	78.00	.....	.....
Iron Body, Screwed, Rack and Pinion..Each	34.50	40.00	54.00	80.00	95.00	110.00
Iron Body, Flanged, Rack and Pinion..Each	39.00	47.00	60.00	88.00	100.00	117.00

For List Prices see page 341.

Order by Figure Number and Style.

COCKS

Lunkenheimer Bronze Cocks

Sizes 1-8 to 2-inch, 150 Lbs. Working Pressure
 Sizes 2 1-2 and 3-inch, 100 Lbs. Working Pressure



Packed Plug Cock
 Fig. No. 805

1-2 to 2-inch, 150 Lbs. Pressure



Stop Cock
 Fig. No. 454

1-8 to 2-inch, 150 Lbs. Pressure
 2 1-2 and 3-inch, 100 Lbs. Pressure



Three-Way Stop Cock
 Fig. No. 573

1-4 to 2-inch, 150 Lbs. Pressure



Four-Way Stop Cock
 Fig. No. 155

1-4 to 1-inch, 150 Lbs. Pressure

LIST PRICES

Size.....Inches	1/8	1/4	3/8	1/2	3/4	1
Fig. No. 805.....Each	.....	.....	.....	3.15	4.10	5.15
Fig. No. 454.....Each	.85	.85	1.00	1.25	1.70	2.35
Fig. No. 573.....Each	.....	2.00	2.20	2.50	3.00	4.30
Fig. No. 155.....Each	.....	4.00	4.40	5.10	6.00	8.70
Fig. No. 805, End to End....Inches	.....	.....	.....	2 3/8	2 3/4	3 1/4
Fig. No. 454, End to End....Inches	1 1/2	1 5/8	1 7/8	2 1/4	2 5/8	3 1/16
Fig. No. 573, End to End....Inches	.....	1 3/4	2 1/8	2 9/16	3	3 11/16
Fig. No. 155, End to End....Inches	.....	2 5/16	2 5/8	2 15/16	3 1/2	4 3/8
Size.....Inches	1 1/4	1 1/2	2	2 1/2	3	.....
Fig. No. 805.....Each	7.60	11.00	14.00	.....	.....	.....
Fig. No. 454.....Each	3.70	4.85	7.30	14.50	22.50	.....
Fig. No. 573.....Each	6.10	11.50	16.00	.....	.....	.....
Fig. No. 805, End to End....Inches	3 3/4	4 3/16	5 1/8	.....	.....	.....
Fig. No. 454, End to End....Inches	3 1/2	4 1/16	4 7/8	5 15/16	6 3/4	.....
Fig. No. 573, End to End....Inches	4 5/16	4 15/16	6 15/16	.....	.....	.....

Order by Figure Number.

COCKS
Standard Brass Steam Cocks
 For 125 Lbs. Working Pressure



Steam Cock, Square Head
Fig. No. 1471



Steam Cock, Flat Head
Fig. No. 1472



Steam Cock, Tee Head
Fig. No. 1473

LIST PRICES—Fig. Nos. 1471, 1472, 1473

Size.....Inches	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$
Square, Flat or Tee Head.....Each	.85	.85	1.00	1.25	1.70	2.35	3.70
Male and Female.....Each	1.35	1.35	1.45	2.00	2.50	3.00	5.35

Size.....Inches	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4
Square, Flat or Tee Head.....Each	4.85	7.30	14.50	22.50	38.50	50.00
Male and Female.....Each	6.75	9.85	17.50	25.75	.....	.....



Steam Cock, Flanged
Fig. No. 1474



Three-way, Screwed
Fig. No. 1475



Three-way, Flanged
Fig. No. 1476

LIST PRICES—Fig. Nos. 1474, 1475, 1476

Size.....Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Price, Square or Flat Head, Flanged...Each	4.75	5.50	7.30	9.70	11.75	18.00
Price, 3-way, Screwed.....Each	2.50	3.00	3.75	5.75	7.15	11.00
Price, 3-way, Flanged.....Each	7.75	8.75	11.25	14.75	17.75	27.00
Diameter of Flanges.....Inches	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	6

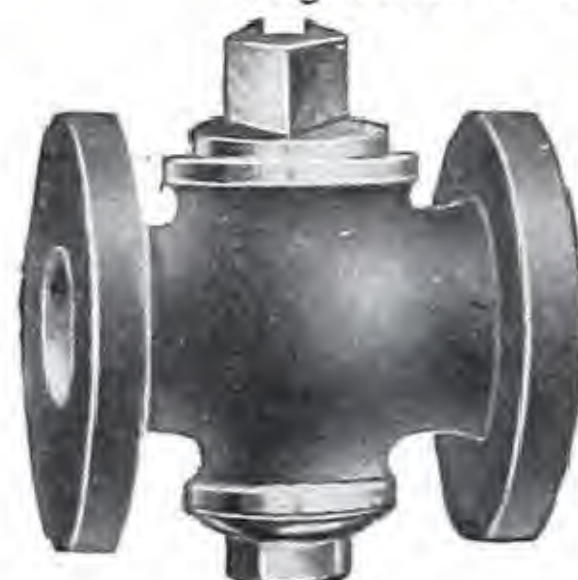
Size.....Inches	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	5	6
Price, Square or Flat Head, Flanged...Each	27.50	43.00	62.00	84.00	150.00	275.00
Price, 3-way, Screwed.....Each	18.75	26.00	50.00	70.00	.....	.....
Price, 3-way, Flanged.....Each	38.25	57.00	85.00	121.00	.....	.....
Diameter of Flanges.....Inches	7	$7\frac{1}{2}$	$8\frac{1}{2}$	9	10	11

For List Prices on drilling, see page 340.
 Order by Figure Number.

COCKS

Iron Cocks

125 Lbs. Working Pressure

Square Head, Screwed
Fig. No. 1481Square Head, Flanged
Fig. No. 1482Flat Head, Screwed
Fig. No. 1483Flat Head, Flanged
Fig. No. 1484

LIST PRICES—Fig. Nos. 1481, 1483

Size.....Inches	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Price, all Iron.....Each	.85	.90	1.05	1.30	1.60	1.95	2.70
Price, Iron with Brass Washer.....Each	.95	1.00	1.20	1.55	1.95	2.35	3.20
Price, Iron with Brass Plug.....Each	1.25	1.30	1.60	1.90	2.65	3.75	5.25
Iron with Brass Plug and Washer.....Each	1.35	1.40	1.75	2.15	3.00	4.15	5.75

Size.....Inches	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	5	6
Price, all Iron.....Each	4.40	6.75	12.00	15.50	32.00	45.00
Price, Iron with Brass Washer.....Each	5.15	7.75	14.00	19.00	38.00	53.00
Price, Iron with Brass Plug.....Each	8.75	13.00	27.50	36.50	67.00	94.00
Iron with Brass Plug and Washer.....Each	9.50	14.00	29.50	40.00	73.00	102.00

LIST PRICES—Fig. Nos. 1482, 1484

Size.....Inches	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$
Price, all Iron.....Each	2.25	2.75	3.25	4.25	6.25
Price, Iron with Brass Washer.....Each	2.50	3.10	3.65	4.75	7.00
Price, Iron with Brass Plug.....Each	3.00	3.75	5.00	7.00	10.50
Price, Iron with Brass Plug and Washer...Each	3.25	4.10	5.40	7.50	11.25
Diameter of Flanges.....Inches	4	$4\frac{1}{2}$	5	6	7

Size.....Inches	3	$3\frac{1}{2}$	4	5	6
Price, all Iron.....Each	9.50	15.00	19.00	36.00	50.00
Price, Iron with Brass Washer.....Each	10.50	17.00	22.50	42.00	58.00
Price, Iron with Brass Plug.....Each	15.75	30.00	40.00	70.00	100.00
Prices, Iron with Brass Plug and Washer...Each	16.75	32.00	43.50	76.00	108.00
Diameter of Flanges.....Inches	$7\frac{1}{2}$	$8\frac{1}{2}$	9	10	11

EXTRA HEAVY IRON COCKS, SCREWED—(Not Ill.) Fig. No. 1485

Size.....Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Price, all Iron.....Each	1.15	1.25	1.75	2.10	2.80	3.65
Price, Iron with Brass Washer.....Each	1.25	1.40	2.00	2.45	3.20	4.15
Price, Iron with Brass Plug.....Each	1.70	2.25	2.80	3.85	5.60	7.00
Price, Iron with Brass Plug and Washer..Each	1.80	2.40	3.05	4.20	6.00	7.50

Size.....Inches	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	5	6
Price, all Iron.....Each	6.50	9.00	16.75	22.50	45.00	62.00
Price, Iron with Brass Washer.....Each	7.25	10.00	18.75	26.00	51.00	70.00
Price, Iron with Brass Plug.....Each	13.25	19.00	42.00	56.00	98.00	133.00
Price, Iron with Brass Plug and Washer...Each	14.00	20.00	44.00	59.50	104.00	141.00

Iron Cocks, when used for water or steam service, should have brass plugs.
For List Prices on drilling, see page 340.
Order by Figure Number.

COCKS

*Three-Way Iron Cocks**For 125 Lbs. Working Pressure*

Square Head, Screwed
Fig. No. 1486



Square Head, Flanged
Fig. No. 1487

LIST PRICES—Fig. No. 1486

Size.....Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
All Iron.....Each	1.50	1.65	1.80	2.05	2.65	3.65
Iron, with Brass Washer.....Each	1.60	1.80	2.05	2.40	3.05	4.15
Iron, with Brass Plug.....Each	1.90	2.20	2.40	3.10	4.50	6.25
Iron, with Brass Plug and Washer, Each	2.00	2.35	2.65	3.45	4.90	6.75
Size.....Inches	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	5	6
All Iron.....Each	5.35	7.50	14.00	19.00	36.50	52.00
Iron, with Brass Washer.....Each	6.10	8.50	16.00	22.50	42.50	60.00
Iron, with Brass Plug.....Each	9.75	13.75	30.00	40.00	71.50	100.00
Iron, with Brass Plug and Washer, Each	10.50	14.75	32.00	43.50	77.50	108.00

LIST PRICES—Fig. No. 1487

Size.....Inches	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$
All Iron.....Each	3.75	4.25	5.25	7.00	9.00
Iron, with Brass Washer.....Each	4.00	4.60	5.65	7.50	9.75
Iron, with Brass Plug.....Each	4.50	5.25	7.00	9.50	13.25
Iron, with Brass Plug and Washer.. Each	4.75	5.60	7.40	10.00	14.00
Diameter of Flanges.....Inches	4	$4\frac{1}{2}$	5	6	7
Size.....Inches	3	$3\frac{1}{2}$	4	5	6
All Iron.....Each	12.75	20.00	26.00	44.00	60.00
Iron, with Brass Washer.....Each	13.75	22.00	29.50	50.00	68.00
Iron, with Brass Plug.....Each	19.00	36.00	47.00	80.00	108.00
Iron, with Brass Plug and Washer. Each	20.00	38.00	50.50	86.00	116.00
Diameter of Flanges.....Inches	$7\frac{1}{2}$	$8\frac{1}{2}$	9	10	11

Iron Cocks, when used for water or steam service, should have brass plugs.

For List Prices on drilling, see page 340.

Order by Figure Number.

COCKS

Pratt & Cady Cocks

Standard—Iron

Vulcanized Asbestos—Groove Packed

1/2" to 2"—125 Lbs. Steam Pressure

2 1/2" to 6"—100 Lbs. Steam Pressure

Tested to 350 Lbs.

Tested to 300 Lbs.



1/8" to 2"—Fig. No. 247

2 1/2" to 6"—Fig. No. 248



1" to 2"—Fig. No. 249

2 1/2" to 9"—Fig. No. 250

LIST PRICES—Fig. Nos. 247, 248

Size.....Inches	1/8	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2
Fig. Nos. 247, 248.....Each	1.60	1.60	1.60	1.60	2.10	2.50	3.50	4.75
End to End.....Inches	2 5/8	2 5/8	2 5/8	3	3 3/8	4	4 5/8	5 3/8

Size.....Inches	2	2 1/2	3	2 1/2	4	5	6
Fig. Nos. 247, 248.....Each	7.00	12.00	18.00	27.00	30.00	45.00	60.00
End to End.....Inches	6	7	8 1/8	8 3/4	9 1/2	11 1/2	14 3/4

LIST PRICES—Fig. Nos. 249, 250

Size.....Inches	1	1 1/4	1 1/2	2	2 1/2
Fig. Nos. 249, 250.....Each	2.50	3.50	4.75	7.00	12.00
Face to Face.....Inches	5 1/2	5 3/4	5 7/8	7 1/8	8 1/4
Diameter of Flanges.....Inches	4	4 1/2	5	6	7

Size.....Inches	3	3 1/2	4	5	6
Fig. Nos. 249, 250.....Each	18.00	27.00	30.00	45.00	60.00
Face to Face.....Inches	9 1/4	10 1/4	11 1/2	13 3/4	16
Diameter of Flanges.....Inches	7 1/2	8 1/2	9	10	11

Sizes 1/8" to 2" have two bolts. Sizes 2 1/2" to 4" have four bolts.

For List Prices on drilling, see page 340.

Order by Figure Number.

COCKS

Pratt & Cady Cocks

Extra Heavy—Iron

Vulcanized Asbestos—Groove Packed

0 Lbs. Steam Pressure

1/2" to 2" Tested to 700 Lbs.
2 1/2" to 4" Tested to 600 Lbs.



1/2" to 2"—Fig. No. 255

2 1/2" to 4"—Fig. No. 256

1" to 2"—Fig. No. 257

2 1/2" to 4"—Fig. No. 258

LIST PRICES—Fig. Nos. 255, 256

Size, Inches	1/2	3/4	1	1 1/4	1 1/2
Fig. Nos. 255, 256..... Each	2.40	3.00	3.50	5.00	6.75
Face to End..... Inches	3 3/4	4 1/8	4 3/4	5 3/8	5 7/8
Size, Inches	2	2 1/2	3	3 1/2	4
Fig. Nos. 255, 256..... Each	10.00	17.00	26.00	38.00	42.00
Face to End..... Inches	6 7/8	8 3/8	10 7/8	12	15

LIST PRICES—Fig. Nos. 257, 258

Size, Inches	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4
Fig. Nos. 257, 258..... Each	3.50	5.00	6.75	10.00	17.00	26.00	38.00	42.00
Face to Face..... Inches	5 1/8	5 5/8	6 3/4	8	10	11 1/2	12 3/4	15
Diameter of Flanges..... Inches	4 1/2	5	6	6 1/2	7 1/2	8 1/4	9	10

Sizes 1/2" to 2" have two bolts. Sizes 2 1/2" to 4" have four bolts.

For List Prices on drilling, see page 341.

Order by Figure Number.

COCKS

*Lever Handle Stop and Stop and Waste Cocks**Brass*

Stop Cock
Fig. No. 1501



Stop and Waste
Fig. No. 1502

LIST PRICES—PER DOZEN

Size.....Inches	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1
Fig. No. 1501.....Per Doz.	\$20.40	\$21.00	\$29.40	\$52.80
Fig. No. 1502.....Per Doz.	21.00	21.60	30.00	54.00

Size.....Inches	$1\frac{1}{4}$	$1\frac{1}{2}$	2	....
Fig. No. 1501.....Per Doz.	\$89.40	\$149.40	\$258.00	....
Fig. No. 1502.....Per Doz.	91.20	152.40	264.00	....

Iron Cock Wrenches
For Gas and Steam Cocks



Iron Cock Wrench, Square Head—Fig. No. 1498

LIST PRICES—Fig. No. 1498

Size of Square Opening.....Inches	$\frac{5}{8}$	$\frac{5}{8}$	$\frac{13}{16}$	$\frac{15}{16}$	$1\frac{1}{16}$	$1\frac{3}{16}$
Size of Cock.....Inches	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$
Price.....Each	\$0.06	.07	.09	.14	.19	.25

Size of Square Opening.....Inches	$1\frac{5}{16}$	$1\frac{5}{8}$	2	$2\frac{3}{16}$	$2\frac{5}{8}$	....
Size of Cock.....Inches	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	....
Price.....Each	\$0.44	.56	.56	1.00	1.00	....

Order by Figure Number.

COCKS
Ground Bibbs
Brass—For Iron Pipe



Ground Bibb with Shoulder
 Fig. No. 1507



Ground Bibb with Shoulder, for Hose
 Fig. No. 1508

LIST PRICES—PER DOZEN

Size.....Inches		$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$
Fig. No. 1507, Rough.....Per Doz.		\$19.80	\$20.40	\$21.00	\$29.40
Fig. No. 1507, Finished.....Per Doz.		24.60	25.20	25.80	35.40
Fig. No. 1507, Nickel Plated.....Per Doz.		29.40	30.00	30.60	41.40
Fig. No. 1508, Rough.....Per Doz.				24.00	32.40
Fig. No. 1508, Finished.....Per Doz.				28.80	38.40
Fig. No. 1508, Nickel Plated.....Per Doz.				33.60	44.40

Size.....Inches		1	1 $\frac{1}{4}$	1 $\frac{1}{2}$	2
Fig. No. 1507, Rough.....Per Doz.		\$52.80	\$ 89.40	\$149.40	\$258.00
Fig. No. 1507, Finished.....Per Doz.		64.80	107.40	179.40	300.00
Fig. No. 1507, Nickel Plated.....Per Doz.		76.80	125.40	209.40	342.00
Fig. No. 1508, Rough.....Per Doz.		60.00	100.20	164.40	280.20
Fig. No. 1508, Finished.....Per Doz.		72.00	118.20	194.40	322.20
Fig. No. 1508, Nickel Plated.....Per Doz.		84.00	136.20	224.40	364.20



Compression Bibb with Shoulder
 Fig. No. 1509

Compression Bibbs
Brass—For Iron Pipe



Compression Bibb with Shoulder, for Hose
 Fig. No. 1510

LIST PRICES—PER DOZEN

Size.....Inches		$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1
Fig. No. 1509, Rough.....Per Doz.		\$16.80	\$17.40	\$22.80	\$54.00
Fig. No. 1509, Finished.....Per Doz.		18.60	19.80	25.20	60.00
Fig. No. 1509, Nickel Plated.....Per Doz.		22.20	23.40	28.80	66.00
Fig. No. 1510, Rough.....Per Doz.			20.40	25.80	61.20
Fig. No. 1510, Finished.....Per Doz.			22.80	28.20	67.20
Fig. No. 1510, Nickel Plated.....Per Doz.			26.40	31.80	73.20

Order by Figure Number and specify Finish.

COCKS

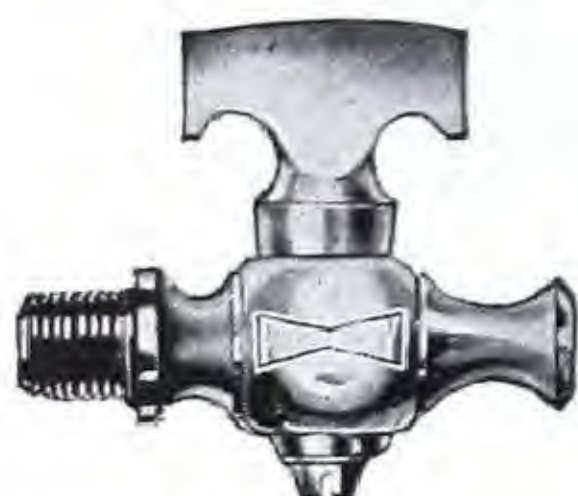
*Penberthy Air Cocks**Polished Brass Finish*

Fig. Nos. 6, 7, 8, 9

LIST PRICES

Figure..Number	6	7	8	9
Size.....Inches	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$
Price.....Each	.40	.45	.50	.60

Fig. Nos. 8, 9, made with Hexagon Shank.



Fig. Nos. 12, 13, 14, 15

LIST PRICES

Figure..Number	12	13	14	15
Size.....Inches	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$
Price.....Each	.55	.60	.65	.75

Fig. Nos. 14, 15 made with Hexagon Shank

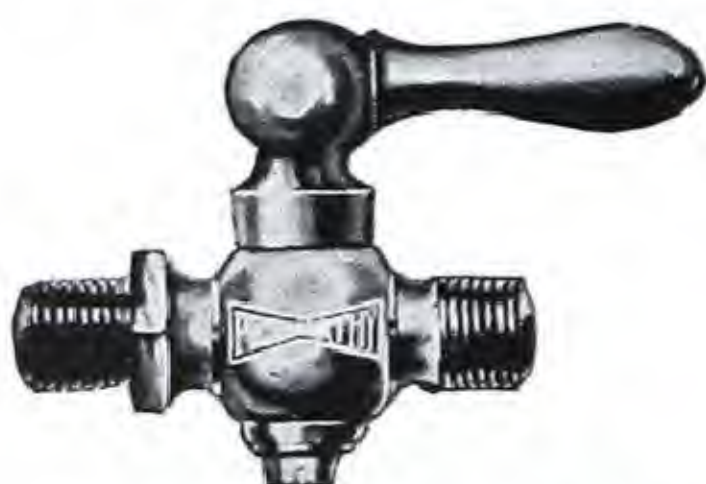


Fig. Nos. 18, 19, 20, 21

LIST PRICES

Figure..Number	18	19	20	21
Size.....Inches	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$
Price.....Each	.55	.65	.75	.90



Fig. Nos. 22, 23, 24, 25

LIST PRICES

Figure..Number	22	23	24	25
Size.....Inches	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$
Price.....Each	.70	.80	.90	1.05

Order by Figure Number.

COCKS

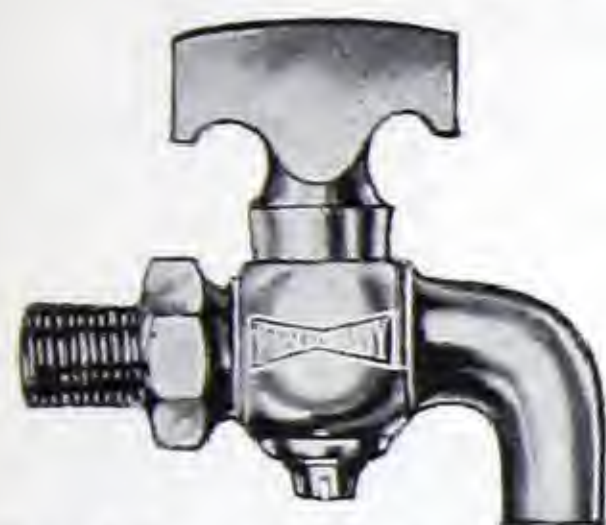
Penberthy Bibb Air Cocks

Fig. Nos. 26, 27, 28, 33

LIST PRICES

Figure..Number	26	27	28	33
Size.....Inches	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$
Fin. S.T....Each	.70	.80	.90	1.00



Fig. Nos. 29, 30, 31, 32

LIST PRICES

Figure..Number	29	30	31	32
Size.....Inches	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$
Fin. S.T....Each	.85	.95	1.05	1.15

*Penberthy Steam Gauge Cocks**Polished Brass Finish*

Fig. Nos. 37, 38, 39

LIST PRICES

Figure....Number	37	38	39
Size.....Inches	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$
Price.....Each	.65	.70	.85



Figs. 40, 41, 42

LIST PRICES

Figure....Number	40	41	42
Size.....Inches	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$
Price.....Each	.75	.80	.90

Order by Figure Number.

STEAM SPECIALTIES, ETC.

Penberthy Compression Gauge Cocks

Standard

Special Registered Extra Heavy

150 Lbs. Steam Pressure

200 Lbs. Steam Pressure

Rough or Polished Brass



Standard Gauge Cock
Without Stuffing Box
Fig. No. 99



Standard Gauge Cock
With Stuffing Box
Fig. No. 304



Extra Heavy Gauge Cock—With Stuffing Box
Fig. No. 556

LIST PRICES—Fig. Nos. 99, 304

Figure Number	Style Number	Finish	Price, Each			Style Wheel
			$\frac{3}{8}$ -Inch	$\frac{1}{2}$ -Inch	$\frac{3}{4}$ -Inch	
99	1	Rough	\$0.75	\$0.85	\$0.95	Iron
99	6	Finished	.95	1.00	1.25	Wood
304	3	Rough	.90	.95	1.20	Iron
304	8	Finished	1.20	1.30	1.45	Wood

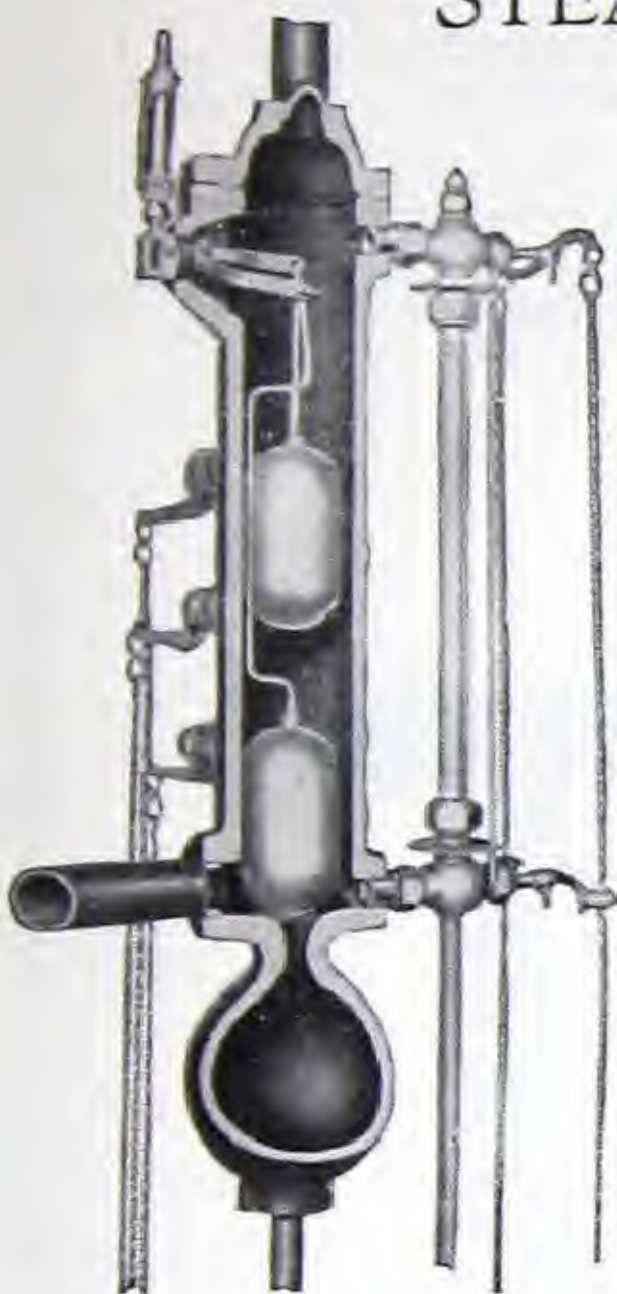
LIST PRICES—Fig. No. 556

Style Number	Price Each	Size Shank	Finish	* Style Wheel
N.W.R.	\$2.00	$\frac{3}{4}$	Rough	Iron
N.W.F.	3.00	$\frac{3}{4}$	Polished	Wood

*Regularly furnished with wheels as listed. Other style supplied when so ordered.
 Penberthy Standard Gauge Cocks are well designed, strong and practical.
 Penberthy Special Extra Heavy Gauge Cocks are designed for severe conditions where high steam pressures are carried, and have full $\frac{3}{8}$ -inch openings throughout.
 These Gauge Cocks are registered, for pressures shown above, in the various Provinces requiring same.

Order by Figure and Style Numbers.

STEAM SPECIALTIES, ETC.

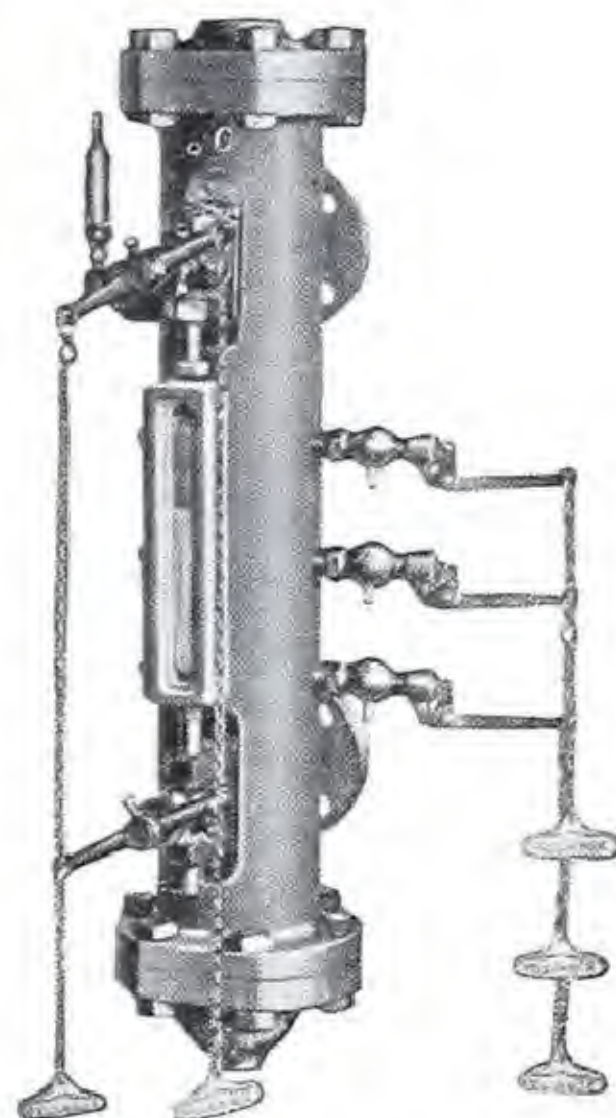
Reliance Safety
Water Columns

Sectional View
High and Low Alarm
Fig. No. 1581
Column Nos. 1, 5, 7, 9)



Reliance Jr.
Low Water Alarm
Fig. No. 1584

Low Water Alarm
(Not Ill.)
Fig. No. 1583
(Column Nos. 2, 6)



Forged Steel Column
High and Low Alarm
For High Pressures
Fig. No. 1582
(Column Nos. 53, 73)

COMBINED HIGH AND LOW WATER ALARMS

Column No.	List Price	Kind of Boiler	Variation between Alarms	Size Steam and Water Conn.	Water Gauge Connections		Size of Blowoff	Gauge Cock Connections		Center Water Conn. to Top Column	Length Over All
					Center to Center	Size		Center to Center	Size		
1†	\$28.00	36"-54"	6"	1"	13 1/2"	1/2"	3/4"	3"	1/2"	16 1/4"	23 1/4"
5†	30.00	54"-72"	8"	1 1/4"	18"	3/4"	3/4"	4"	3/4"	21 1/4"	29 3/4"
7	35.00	Wt.tube	12"	1 1/2"	21"	3/4"	3/4"	6"	3/4"	26"	36"
9	40.00	Wt.tube	18"	1 1/2"	28"	3/4"	1"	9"	3/4"	33 1/2"	44"
53*	100.00	.....	8 1/2"	\$18"	18"	3/4"	△	4"	3/4"	23 1/4"	32"
73*	125.00	.....	12"	\$21"	21"	3/4"	△	6"	3/4"	29"	39"

LOW WATER ALARMS

Reliance Jr.	\$15.00	.....	.....	1"	.....	.....	.....	.....	.....	.....	10 3/8"
2†	25.00	36"-54"	Low only	1"	13 1/2"	1/2"	3/4"	3"	1/2"	16 1/4"	23 1/4"
6	28.00	54"-72"	Low only	1 1/4"	15 3/4"	3/4"	3/4"	4"	3/4"	18 1/4"	28"

*Screw connections; for Flanged add \$50 to list prices. Forged steel columns for pressures to 425 pounds.

†200 pounds pressure only.

‡May be furnished without alarms, list price \$22.00.

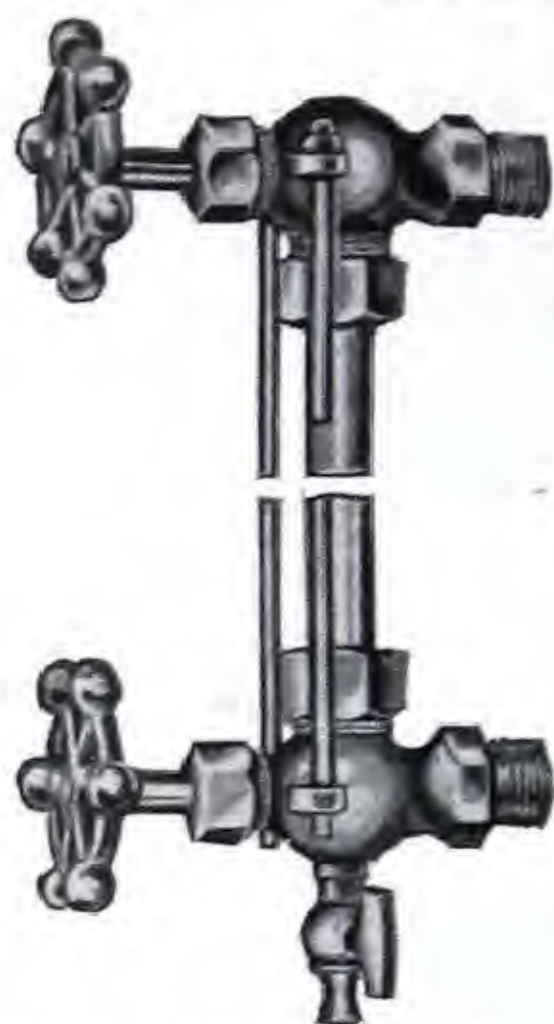
§Centers, not size—applies to flanged columns only.

△All for 1 1/2 steam and water connections and 3/4" blow-off.

Note: List prices do not include water gauge and gauge valves. Prices on application.

When ordering, specify Figure and Column Numbers.

STEAM SPECIALTIES, ETC.

*Penberthy Standard**Round Body Brass Water Gauges**Rough and Polished**For Pressures up to 150 Lbs.*

Rough Body, Iron Wheels
Fig. No. 302



Polished Body, Wood Wheels
Fig. No. 303

LIST PRICES—Fig. No. 302

Size Number	Price Each	Pipe Thread on Shank	Size of Glass	Number of Guards
81-A	\$2.75	$\frac{3}{8}$	$\frac{5}{8}$ x 12	2
84-A	3.00	$\frac{1}{2}$	$\frac{5}{8}$ x 12	2
88-A	4.50	$\frac{3}{4}$	$\frac{3}{4}$ x 14	2

LIST PRICES—Fig. No. 303

Size Number	Price Each	Pipe Thread on Shank	Size of Glass	Number of Guards
81-G	\$3.75	$\frac{3}{8}$	$\frac{5}{8}$ x 12	2
84-G	4.25	$\frac{1}{2}$	$\frac{5}{8}$ x 12	2
88-G	5.50	$\frac{3}{4}$	$\frac{3}{4}$ x 14	2

These Gauges are suitable for 150 lbs. steam pressure and are registered in accordance with the specifications of the various Provinces requiring same.

Penberthy Standard Round Body Water Gauges are well designed, strong and practical.

Order by Figure and Size Numbers.

STEAM SPECIALTIES, ETC.

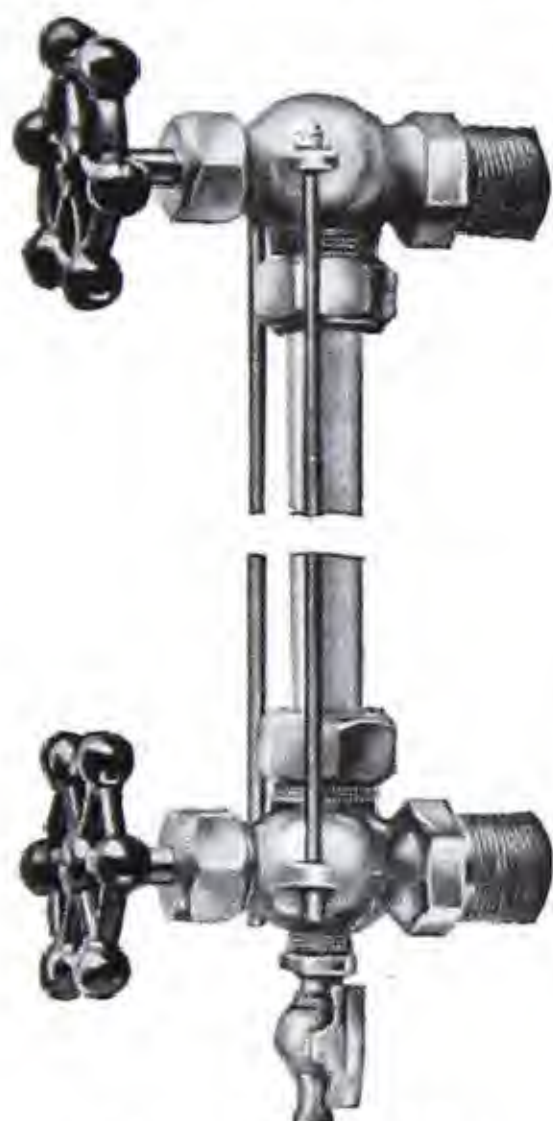
*Penberthy Special Registered Extra Heavy**Round Body Brass Water Gauges**Rough or Polished**For Pressures up to 200 Lbs.*

Fig. No. 555

LIST PRICES

Style Number	Price Each	Size Shank	Size of Glass	Number of Guards	Finish
Special N.W.R.	\$5.00	$\frac{3}{4}$	$\frac{3}{4}$ x 14	2	*Rough Iron Wheels
Special N.W.F.	7.25	$\frac{3}{4}$	$\frac{3}{4}$ x 14	2	Finished, Wood Wheel

Polished style furnished with wood hand wheels.

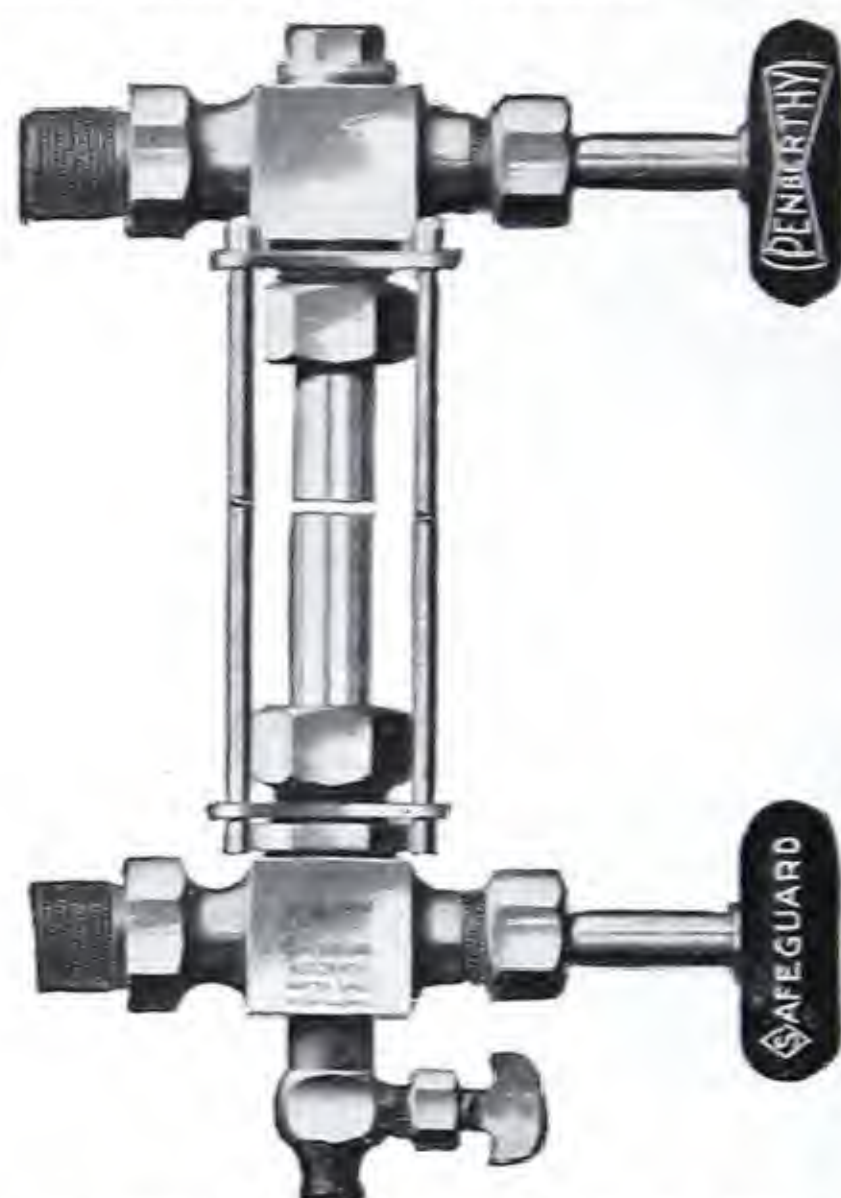
*Rough style regularly furnished with iron hand wheels, although wood wheels will be supplied when specified at the same price.

Longer glasses than those listed above at small additional cost.

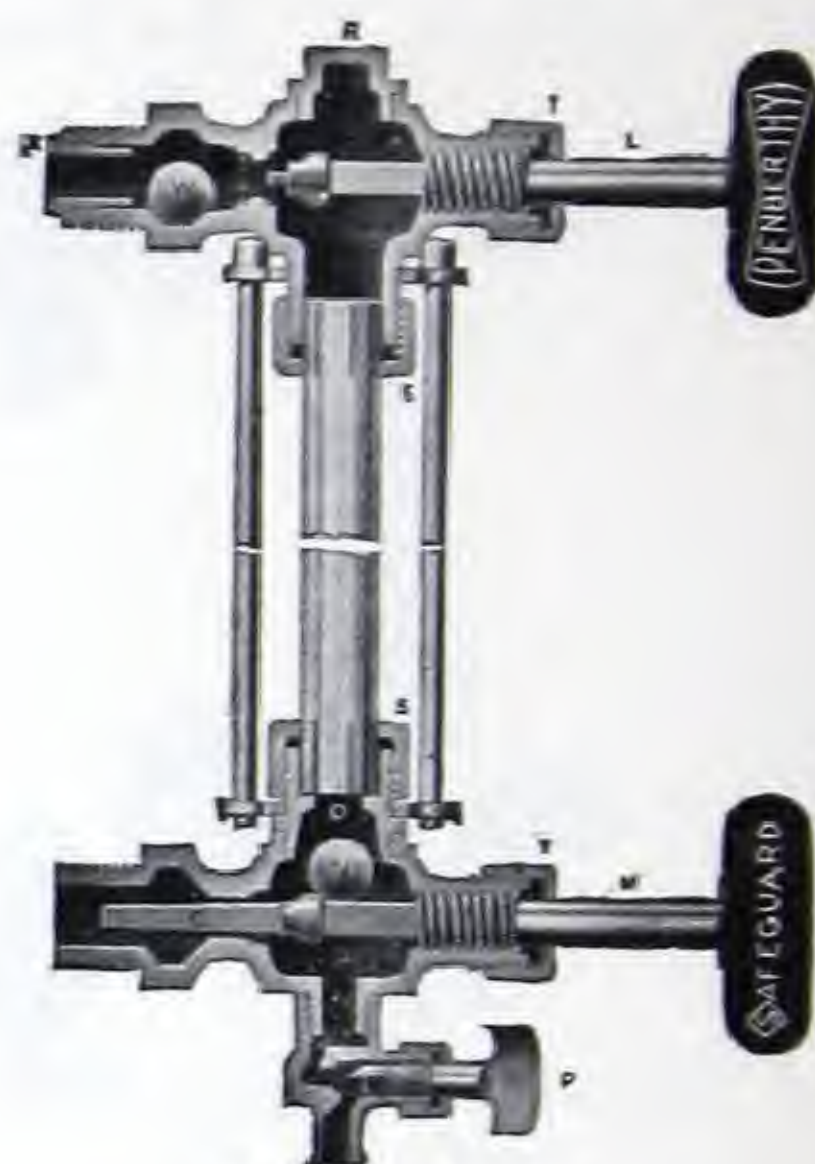
Penberthy Special Extra Heavy Round Body Water Gauges are designed for severe conditions where high steam pressures are carried, and are specially adaptable for Portable and Traction Engines. The openings through this gauge are all full $\frac{3}{8}$ -inch, and gauge is approved and registered for 200 lbs. steam pressure in accordance with the specifications of the various Provinces requiring same.

Order by Figure and Style Numbers.

STEAM SPECIALTIES, ETC.

*Penberthy "Safeguard" Automatic Water Gauges**(Patented)**200 Lbs. Steam Pressure**Tested to 300 Lbs.*

"Safeguard" Automatic Water Gauge
Fig. No. 64



Sectional View

LIST PRICES

$\frac{1}{2}$ -inch Shank, complete, with Guards, and $\frac{5}{8}$ -inch x 12-inch Glass.....	Each	\$5.00
$\frac{3}{4}$ -inch Shank, complete, with Guards, and $\frac{3}{4}$ -inch x 14-inch Glass.....	Each	6.50

Longer glasses than above at a small additional cost.

This gauge is also manufactured in a registered style in accordance with specifications of the various Provinces requiring same. On these Registered Gauges the Standard Lists, as above, will apply.

Operates on any pressure.

Self-Cleaning by the action of the blow-off vibrating the balls. The cleaning stem in lower shank goes all the way through into the boiler, absolutely preventing opening from ever being closed by scale, etc.

Balls cannot seat unless glass is broken, because the upper ball seat is designed to leak. This leak can never be stopped accidentally, as the ball seat is square in the $\frac{1}{2}$ -inch size and hexagonal shaped in the $\frac{3}{4}$ -inch size, allowing passages which, because of their shape and size, can never become clogged. This leak, also, is positively necessary to insure perfect operation of an automatic gauge. Lugs are cast in the body to support ball in lower arm, in case stem is removed. The Penberthy pet-cock, with which all Safeguard gauges are equipped, is slow opening and closing; thus allowing the blowing off of the gauge to be done gradually, which prevents the balls from seating.

Glass is protected from being broken when blown out, as the slow opening and closing pet-cock prevents the temperature in the glass from being suddenly changed.

Order by Figure Number.

STEAM SPECIALTIES, ETC.

*Scotch Gauge Glasses**For Pressures up to 200 Lbs.*

Scotch Gauge Glasses

LIST PRICES PER DOZEN

Length Inches	EXTERNAL DIAMETER IN INCHES			
	$\frac{1}{2}$ and $\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1
8	\$2.52	\$3.00	\$4.08	\$4.92
9	2.76	3.36	4.68	5.52
10	3.00	3.60	5.04	6.12
11	3.24	3.96	5.64	6.72
12	3.60	4.32	6.12	7.32
13	3.84	4.80	6.60	7.92
14	4.20	5.16	7.08	8.52
15	4.44	5.52	7.56	9.12
16	4.80	5.88	8.16	9.72
17	5.04	6.24	8.64	10.32
18	5.40	6.60	9.12	10.92
19	5.64	7.08	9.60	11.52
20	6.00	7.44	10.20	12.12
21	6.36	7.80	10.68	12.84
22	6.60	8.16	11.16	13.44
23	6.96	8.52	11.64	14.04
24	7.20	8.88	12.12	14.64
30	9.00	11.16	15.24	18.24
36	10.80	13.44	18.24	21.96
42	12.60	15.72	21.36	25.68
48	14.52	18.00	24.36	29.16
54	16.32	20.28	27.48	33.00
60	18.12	22.56	30.48	36.48
66	20.04	24.84	33.48	40.32
72	21.84	27.12	36.48	43.80

Sizes $1\frac{1}{4}$ inch and $1\frac{1}{2}$ inch, prices on application.

Irregular lengths are charged at price of next longer length.

STEAM SPECIALTIES, ETC.

Scotch Gauge Glasses

For Steam Pressures up to 400 Lbs.

Scotch Gauge Glasses

LIST PRICES PER DOZEN

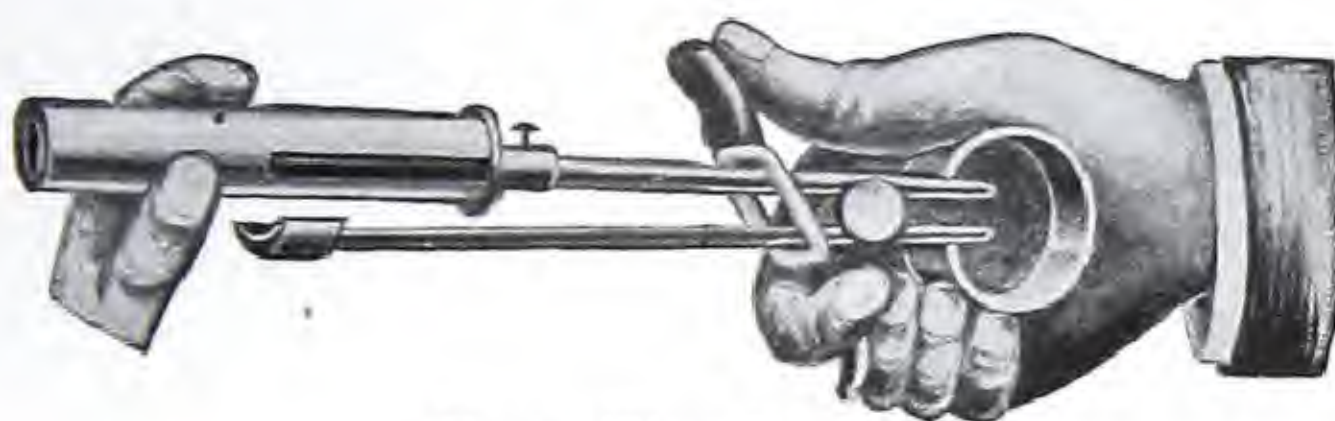
Length Inches	EXTERNAL DIAMETER IN INCHES						
	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$
8	\$2.64	\$3.36	\$4.68	\$6.12	\$7.92	\$12.24	\$21.96
9	2.88	3.72	5.28	6.72	8.64	13.80	24.72
10	3.12	4.08	5.76	7.32	9.24	15.24	27.48
11	3.36	4.56	6.24	7.92	10.08	16.80	30.12
12	3.72	4.92	6.72	8.64	11.04	18.36	32.88
13	3.96	5.28	7.20	9.24	11.88	19.80	35.64
14	4.32	5.76	7.80	9.96	12.84	21.36	38.40
15	4.68	6.12	8.40	10.68	13.80	22.92	41.16
16	4.92	6.48	9.00	11.40	14.64	24.36	43.80
17	5.28	6.96	9.48	12.12	15.60	25.92	46.56
18	5.52	7.32	10.08	12.84	16.44	27.48	49.32
19	5.88	7.80	10.56	13.56	17.40	28.92	52.08
20	6.12	8.16	11.16	14.28	18.36	30.48	54.84
21	6.48	8.64	11.76	15.00	19.20	32.04	57.60
22	6.72	9.00	12.36	15.72	20.16	33.48	60.24
23	7.08	9.36	12.84	16.44	21.00	35.04	63.00
24	7.44	9.84	13.44	17.28	22.08	36.72	65.76
30	9.36	12.36	16.80	21.60	27.60	45.96	82.20
36	11.16	14.76	20.16	25.92	33.12	55.08	98.64
42	13.08	17.28	23.52	30.24	38.64	64.32	115.08
48	14.88	19.68	26.88	34.56	44.16	73.44	131.52
54	16.80	22.20	30.24	38.88	49.68	82.68	147.96
60	18.60	24.60	33.60	43.20	55.20	91.80	164.40
66	20.52	27.12	36.96	47.52	60.72	101.04	180.84
72	22.32	29.52	40.32	51.84	66.24	110.16	197.28

Irregular lengths are charged at price of next longer length.

STEAM SPECIALTIES, ETC.

Gauge Glass Cutter, Steam Gauge Siphons
Rubber Washers

Chesterton



Gauge Glass Cutter
Fig. No. 1534

Price, Nickel Plated Each \$2.00



Steam Gauge Siphon
Steel Pipe—Fig. No. 1535

Size	Inches	$\frac{1}{4}$
Fig. No. 1535, Steel Pipe, Vertical or Angle Pattern	Each	\$0.50

Rubber Washers

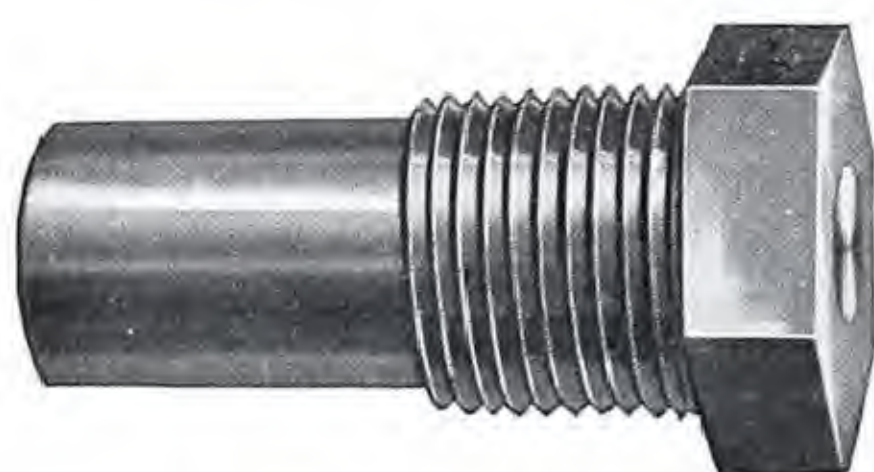
To Fit Tubes for Water Gauges

Size Inches	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1
Price Per Dozen . . . . .	.20	.25	.30	.40	.60

In addition to the various items here shown which are used and form an important part of every Power Plant Engineer's Emergency Kit, we can furnish a complete line of Power plant supplies. These supplies are so well known that they are not here listed or shown. We are always pleased to quote prices or render any possible service along this line.

Order by Figure Number.

STEAM SPECIALTIES, ETC.

Fusible Plugs

Boiler Shell Fusible Plug

Fig. No. 1150

Type No. 1 for Outside Insertion

Fig. No. 1151 (Not Illustrated)

Type No. 2 for Inside Insertion



Boiler Tube Fusible Plug

Fig. No. 1152

Type No. 3 for Outside Insertion

Type No. 4 for Inside Insertion

These Fusible Plugs are filled with a fusible metal called Banca Tin. The type most widely used is No. 1. On this type of Plug the chamber for retaining the tin is tapered so that the larger area of tin is at the plain end, exposed to the pressure side, and the smaller area at the Hexagon end, exposed to the fire.

Type No. 2 Fusible Plug is for inside insertion. It is used where the plug is inserted from the pressure side.

Type No. 3 is a boiler tube plug for outside insertion.

Type No. 4 is a boiler tube plug for inside insertion.

The Banca Tin fusible filling in Type Nos. 2, 3 and 4, is in tapered form the same as Type No. 1.

Fusible Plugs should always be inserted so that the smaller end of the taper is exposed to the fire.

Approved by and registered in the Provincial Boiler Inspection Department.

Unless otherwise specified, Type No. 1, Figure Number 1150, will be supplied.

LIST PRICES

Size—Pipe Thread.....Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Fig. No. 1150, Type No. 1....Each	\$1.20	1.50	2.00	3.00	4.00	6.00
Fig. No. 1151, Type No. 2....Each	1.20	1.50	2.00	3.00	4.00	6.00
Fig. No. 1152, Type Nos. 3 and 4 Each	.60	.75	1.00	1.50	2.00	3.00

Order by Figure Number and Type Number.

STEAM SPECIALTIES, ETC.

Morrison Pressure Gauges



Single Spring Pressure Gauge
Approved by Und. Lab. for use
in Automatic Sprinkler Systems
Fig. No. 844

Single Spring Pressure Gauge
Government Approved
(Not Illustrated)

High Pressure—Fig. No. 828

Low Pressure—Fig. No. 829

Double Spring Pressure Gauge
Government Approved
(Not Illustrated)

High Pressure—Fig. No. 830

LIST PRICES—Fig. No. 844

Diameter of Dial.....Inches	4½	5	6	6¾	8½	10	12
Brass Case.....Each	\$10.00	\$11.00	\$16.00	\$20.00	\$30.00	\$40.00	\$75.00

LIST PRICES—Fig. Nos. 828, 829

Diameter of Dial Inches	Jap'd Iron Case		Brass Case and Ring		Deep Brass Case Octagonal Ring	
	Br. Ring Each	N.P. Ring Each	Finished Each	N.P. Each	Fin. Each	N.P. Each
2	\$ 6.00	\$ 6.15	\$ 8.00	\$ 8.60	.....	.....
2½	6.00	6.15	8.00	8.60	.....	.....
3½	7.00	7.18	9.00	9.75	.....	.....
4	8.00	8.20	10.00	11.00	.....	.....
4½	8.00	8.20	10.00	11.00	\$11.50	\$12.50
5	8.00	8.20	11.00	12.00	12.50	13.50
6	13.00	13.50	16.00	17.50	18.50	20.00
6¾	16.00	16.60	20.00	22.00	23.00	25.00
8½	22.00	22.75	30.00	32.50	33.50	36.00
10	32.00	33.00	40.00	43.00	44.00	47.00
12	50.00	51.50	75.00	79.00	80.00	84.00

LIST PRICES—Fig. No. 830

Diameter of Dial Inches	Jap'd Iron Case		Brass Case and Ring		Deep Brass Case Octagonal Ring	
	Br. Ring Each	N.P. Ring Each	Finished Each	N.P. Each	Fin. Each	N.P. Each
4	\$10.00	\$10.20	\$12.00	\$13.00	.....	.....
4½	10.00	10.20	12.00	13.00	.....	.....
5	11.00	11.20	13.00	14.00	.....	.....
6	15.00	15.50	18.00	19.50	\$20.50	\$22.50
6¾	18.00	18.60	22.00	24.00	25.00	27.00
8½	25.00	25.75	34.00	36.50	37.50	40.00
10	37.00	38.00	45.80	48.00	49.00	52.00
12	55.00	56.50	80.00	84.00	85.00	89.00

These Gauges can be furnished in any standard graduation.
Order by Figure Number. State desired graduation.

STEAM SPECIALTIES, ETC.

Morrison Pressure Gauges



Compound Pressure and Vacuum Gauge
Fig. No. 837

Vacuum Gauge (Not Illustrated)
Fig. No. 836

Altitude Gauge (Not Illustrated)
Fig. No. 841

Hydraulic Gauge (Not Illustrated)
Fig. No. 846

LIST PRICES, VACUUM GAUGE—Fig. No. 836

Diameter of Dial Inches	2½	4	4½	5	6	6¾	8½	10	12
Jap'd Iron Case, Br. Ring. . . Each	6.00	8.00	8.00	8.00	13.00	16.00	22.00	32.00	50.00
Jap'd Iron Case, N.P. Ring. . Each	6.15	8.20	8.20	8.20	13.50	16.60	22.75	33.00	51.50
Brass Case and Ring, Fin. . . Each	8.00	10.00	10.00	11.00	16.00	20.00	30.00	40.00	75.00
Brass Case and Ring, N.P. . . Each	8.60	11.00	11.00	12.00	17.50	22.00	32.50	43.00	79.00
Deep Br. Case, Oct. Ring, Fin. Ea.	.....	.....	.....	.....	18.50	23.00	33.50	44.00	80.00
Deep Br. Case, Oct. Ring, N.P. Ea.	.....	.....	.....	.....	20.00	25.00	36.00	47.00	84.00

LIST PRICES, PRESS. AND VAC. GAUGE—Fig. No. 837

Diameter of Dial Inches	4	4½	5	6	6¾	8½	10	12
Jap'd Iron Case, Br. Ring. . . Each	12.00	12.00	14.00	16.00	20.00	30.00	40.00	60.00
Jap'd Iron Case, N.P. Ring. . Each	12.20	12.20	14.25	16.50	20.60	30.75	41.00	61.50
Brass Case and Ring, Fin. . . Each	14.00	14.00	16.00	20.00	25.00	40.00	50.00	80.00
Brass Case and Ring, N.P. . . Each	15.00	15.00	17.25	21.50	27.00	42.50	53.00	84.00
Deep Br. Case, Oct. Ring, Fin. Ea.	.....	.....	.....	.....	28.00	43.50	54.00	85.00
Deep Br. Case, Oct. Ring, N.P. Ea.	.....	.....	.....	.....	30.00	46.00	57.00	89.00

LIST PRICES, ALTITUDE GAUGE—Fig. No. 841

Diameter of Dial Inches	4	5	6	6¾	8½	10	12
Jap'd Iron Case, Br. Ring. . . Each	\$11.00	\$12.00	\$16.00	\$20.00	\$30.00	\$40.00	\$60.00
Jap'd Iron Case, N.P. Ring. . Each	11.20	12.20	16.50	20.60	30.75	41.00	61.50
Brass Case and Ring, Fin. . . Each	13.00	14.00	20.00	25.00	40.00	50.00	80.00
Brass Case and Ring, N.P. . . Each	14.00	15.00	21.50	27.00	42.50	53.00	84.00

LIST PRICES, HYDRAULIC GAUGE—Fig. No. 846

Diameter of Dial Inches	5	6	6¾	8½	10	12
Jap'd Iron Case, Br. Ring. . . Each	\$30.00	\$35.00	\$50.00	\$70.00	\$90.00	\$110.00
Jap'd Iron Case, N.P. Ring. . Each	30.50	35.50	50.60	70.75	91.00	111.50
Brass Case, Finished Each	35.00	40.00	60.00	80.00	100.00	125.00
Brass Case, N.P. Each	36.00	41.50	62.00	82.50	103.00	129.00

Hydraulic Gauge is made either with Single Scale denoting pressure in pounds per square inch, or with Double Scale denoting pressure in pounds per square inch and load in tons on ram. In ordering, state diameter of ram and highest pressure carried in lbs. per square inch.

These Gauges can be furnished in any standard graduation.

Order by Figure Number. State desired graduation.

STEAM SPECIALTIES, ETC.

House Heater (Boiler) ThermometersStraight Thermometer with
Temperature Scale

Fig. No. 278

With Pressure and Temperature
Scale (Not Illustrated)

Fig. No. 278P

Angle Thermometer with
Temperature Scale

Fig. No. 280

With Pressure and Temperature
Scale (Not Illustrated)

Fig. No. 280P

LIST PRICES

Fig. No. 278 Straight Form with temperature scale.....	Each	\$1.75
Fig. No. 278P Straight Form with temperature and pressure scale.....	Each	2.00
Fig. No. 280 Angle Form with temperature scale.....	Each	2.00
Fig. No. 280P Angle Form with temperature and pressure scale.....	Each	2.25

Cases of above Thermometers are Cast Iron nickel plated with front and sides polished, presenting an attractive appearance. The scales are black oxidized and the figures white, which, with the special magnifying mercury tube enable convenient reading. Furnished with either mercury or red spirit columns. (Mercury is recommended.)

Scale is 6 inches and graduated approximately 40-240°F. Variations are unavoidable and scales may start as low as 20°F and go up as high as 270°F. Length of stem is 2 inches including thread. Connection is 1/2-inch I.P.S.

These thermometers can be furnished in the side angle type, Fig. Nos. 281 and 281P. Prices on application.

Special prices quoted on orders for a large quantity.

Order by Figure Number.

STEAM SPECIALTIES, ETC.

*Crescent Thermometers**Monel Metal Bulb Chamber*

Straight Type

Fixed Thread—Fig. No. 201

Union Including Standard
Bushing (Not Ill.)—Fig. No. 202Separable Socket, Including
Standard Socket (Not Ill.)

Fig. No. 203



Angle Type

Fixed Thread—Fig. No. 204

Union Including Standard
Bushing (Not Ill.)—Fig. No. 205Separable Socket, Including
Standard Socket (Not Ill.)

Fig. No. 206

LIST PRICES

Size of Scale Inches	CONNECTION					
	Fixed Thread		Union Including Standard Bushing		Separable Socket Includ- ing Std. Socket	
	Type No.	Price Ea.	Type No.	Price Ea.	Type No.	Price Ea.
7	201	\$12.00	202	\$15.00	203	\$18.00
9	201	14.50	202	17.50	203	20.50
12	201	18.00	202	21.00	203	25.00
7	204	15.00	205	18.00	206	21.00
9	204	17.50	205	20.50	206	23.50
12	204	21.00	205	24.00	206	28.00

Stem length is 3½ inches. Standard connection is ¾-inch I. P. S. thread and will be supplied unless otherwise stated. One-inch connection supplied to order without extra charge. Extra charge for 1¼ or 1½-inch connection, \$3.00 list.

The Crescent Thermometer is constructed entirely of brass, highly finished. The scale is "V" shaped and protected by a removable glass front.

All Crescent Thermometers are provided with Bulb Chamber of Monel Metal assuring maximum strength and protection from corrosion. Of particular advantage in Separable Socket Thermometers as the Monel Metal Bulb Chamber cannot bind in the socket.

Order by Figure Number.

STEAM SPECIALTIES, ETC.

Bronze Pop Safety Valves

For Pressures up to 200 Lbs.



Top Outlet
For Steam Service
Fig. No. 713



Side Outlet
For Steam Service
Fig. No. 715



Side Outlet
For Steam Service
Fig. No. 716

Side Outlet For Air Service
(Not Illustrated)
Fig. No. 716-A

LIST PRICES

Size.....Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Fig. No. 713.....Each	\$ 8.00	10.00	12.00	15.00	20.00	30.00
Fig. No. 715.....Each	10.00	10.00	12.00	15.00	20.00	30.00
Fig. No. 716.....Each	....	....	12.00	15.00	20.00	30.00
Fig. No. 716-A .....Each	8.00	10.00	12.00	15.00	20.00	30.00

Fig. No. 713, Top Outlet Valves are designed for and widely used on stationary and portable boilers, tractors or similar equipment. Fig. Nos. 715, 716 and 716-A, Side Outlet permits the piping of the discharge to desired point and is particularly suited for marine work. These valves are Government Approved.

All threaded connections are standard iron pipe size thread.

Fig. No. 713 can be supplied with female thread to order.

Fig. No. 715 can be furnished flanged to order.

In ordering, state pressure at which valve is to be set.

Order by Figure Number.

STEAM SPECIALTIES, ETC.

Pop Safety Valves

Iron Body

Bronze Mounted

For Steam Pressures up to 200 Lbs.



Screwed Inlet and Outlet
Fig. No. 736



Flanged Inlet, Screwed Outlet
Fig. No. 738



Flanged Inlet
Screwed Outlet
Fig. No. 737

LIST PRICES—Fig. Nos. 736, 737

Size.....Inches	2	2½	3	3½
Price, Screwed or Flanged....Each	\$35.00	\$55.00	\$75.00	\$90.00
Diameter of Flanges.....Inches	7½	8¼	9	9

LIST PRICES—Fig. No. 738

Size.....Inches	1½	2	2½	3	3½	4	4½
Price.....Each	\$54.00	\$72.00	\$94.50	\$113.50	\$132.50	\$158.50	\$195.00
Diameter of Inlet.....Inches	2⅛	2⅞	3½	4¼	5	5¾	6½
Outlet, Iron Pipe Size .Inches	2	3	3½	4½	5	6	7
Diameter of Flanges...Inches	7	8¼	9	10¼	11	12½	14

Cast Steel Safety Valves with Non-corrosive Metal Mountings, for use with Superheated Steam. Prices on application.

These valves are Government Approved.

In ordering, state pressure at which valve is to be set.

For List Prices on drilling, see page 341.

Order by Figure Number.

STEAM SPECIALTIES, ETC.

*American Water Relief Valves**For Pressures up to 250 Lbs.**Also Made Extra Heavy For Pressures up to 400 Lbs.*

Water Relief Valve
All Bronze
Fig. No. 1485



Water Relief Valve
All Bronze
Fig. No. 1487

LIST PRICES—Fig. Nos. 1485, 1487

Size.....Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$
Standard Finished.....Each	\$10.00	\$10.00	\$12.00	\$15.00	\$18.00
Standard Finished, N.P.....Each	11.00	11.00	13.00	17.00	21.00
Extra Heavy Finished.....Each	11.00	11.00	13.00	16.00	19.00
Extra Heavy Finished, N.P.....Each	12.00	12.00	14.00	18.00	22.00
Size.....Inches	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4
Standard Finished.....Each	\$27.00	\$43.00	\$72.00	\$95.00	\$120.00
Standard Finished, N.P.....Each	30.00	47.00	80.00	105.00	125.00
Extra Heavy Finished.....Each	29.00	46.00	77.00	105.00	135.00
Extra Heavy Finished, N.P.....Each	32.00	50.00	85.00	115.00	150.00

The Fig. Nos. 1485 and 1487 Water Relief Valves having an extra large relieving capacity make them adaptable for use in connection with small pumps, etc.

Fig. No. 1487 is furnished with regulating wheel to increase or decrease the opening pressure.

Fig. No. 1485 is furnished without wheel,—the compression screw being covered with cap, thus making it fool-proof.

Sizes 3-inch and larger are made with bolted bonnet. Valves can be furnished with either or both connections flanged at slight additional cost.

Also made extra heavy for pressures up to 400 lbs. Prices on application.

When ordering state pressure valve is to relieve at.

Order by Figure Number.

STEAM SPECIALTIES, ETC.

*American Water Relief Valves**For Pressures up to 250 Lbs.*

Water Relief Valve
All Bronze
Fig. No. 1478



Water Relief Valve
Iron Body—Bronze Mounted
Fig. No. 1491

LIST PRICES—Fig. No. 1478

Size.....Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$
Semi Finished.....Each	\$10.00	\$10.00	\$12.00	\$15.00	\$18.00
Finished.....Each	11.00	11.00	13.00	16.00	19.00
Size.....Inches	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4
Semi Finished.....Each	\$27.00	\$43.00	\$72.00	\$95.00	\$120.00
Finished.....Each	29.00	46.00	77.00	105.00	135.00

LIST PRICES—Fig. No. 1491

Size.....Inches	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$
Screwed or Flanged Inlet, Screwed Outlet.....Each	\$35.00	\$42.00	\$50.00	\$68.00
Size.....Inches	4	$4\frac{1}{2}$	5	.....
Screwed or Flanged Inlet, Screwed Outlet.....Each	\$75.00	\$100.00	\$120.00	.....

The Fig. No. 1478 Water Relief Valve is used extensively on Tanks, Pipe Lines, etc. Can be furnished with female inlet connection on order.

The Fig. No. 1491 is especially adapted for use on pumps, tanks, pipe lines, etc. Inlet flanges furnished in extra heavy dimensions only. Outlet flanges are furnished in standard pressure dimensions. For List Prices on drilling, see page 341.

When ordering please state pressure valve is to relieve at.

Order by Figure Number.

STEAM SPECIALTIES, ETC.

Relief Valves

For Steam, Air or Water Service

Iron Body, Bronze Mounted
For Steam, Air or Water
Service

Fig. No. 744

200 Lbs. Steam or Air
300 Lbs. Water

Bronze

For Steam or Water Service

Fig. No. 724—Screwed Inlet

Fig. No. 725—Flanged Inlet (Not Illustrated)

200 Lbs. Steam

300 Lbs. Water

Iron Body, Bronze Mounted
For Steam, Air or Water
Service

Fig. No. 745

200 Lbs. Steam or Air
300 Lbs. Water

LIST PRICES—Fig. Nos. 744, 745

Size.....Inches	2	2½	3	3 ½	4
Fig. Nos. 744, 745, Screw or Flange Inlet.....Each	\$40.00	42.00	50.00	68.00	75.00
Diameter of Flanges.....Inches	6½	7½	8½	9	10

LIST PRICES—Fig. Nos. 724, 725

Size.....Inches	½	¾	1	1¼	1½	2	2½	3
Fig. No. 724, Screw Inlet.....Each	\$4.75	5.63	7.50	9.38	11.25	15.00	37.50	45.00
Fig. No. 725, Flange Inlet.....Each	...	...	...	12.38	14.75	20.35	44.00	55.30

These valves are Government Approved.

In ordering, state pressure at which valve is to be set.

For List Prices on drilling, see page 341.

Order by Figure Number.

STEAM SPECIALTIES, ETC.

Standard Iron Body Safety Valves

Brass Mounted

For Steam Pressures
up to 100 Lbs.



Globe, Screwed
Fig. No. 1540
Globe, Flanged (Not Ill.)
Fig. No. 1541



Angle, Screwed
Fig. No. 1542
Angle, Flanged (Not Ill.)
Fig. No. 1543



Three-way, Screwed
Fig. No. 1544
Three-way, Flanged (Not Ill.)
Fig. No. 1545

LIST PRICES—Fig. Nos. 1540, 1542, 1544

Size.....Inches	1	1¼	1½	2	2½	3	3½
Price.....Each	4.00	5.00	5.80	7.80	13.25	17.25	23.00
Size.....Inches	4	4½	5	6	7	8	.....
Price.....Each	28.75	34.50	41.50	57.75	93.50	132.00	.....

LIST PRICES—Fig. Nos. 1541, 1543, 1545

Size.....Inches	2	2½	3	3½	4
Price.....Each	10.25	16.00	21.50	27.50	34.00
Diameter of Flanges.....Inches	6	7	7½	8½	9
Size.....Inches	4½	5	6	7	8
Price.....Each	40.00	48.00	65.00	100.00	140.00
Diameter of Flanges.....Inches	9¼	10	11	12½	13½

Sizes 1 to 3-inch have brass swivel top. Larger sizes have cast iron top and can be set at any 90° angle. The stem disc and seat ring are made of brass.

Levers are graduated from 30 to 100 pounds. Can be furnished graduated for higher pressures at a special price.

For List Prices on drilling, see page 340.

Order by Figure Number.

STEAM SPECIALTIES, ETC.

Jenkins Air Gun

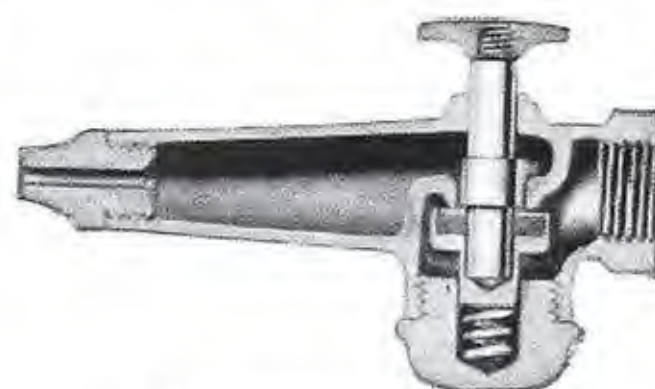
Special Tip
Fig. No. 709-B



Air Gun—Fig. No. 709



Hose Nipple
Fig. No. 709-A



Sectional View

The Jenkins Air Gun is of simple, though very durable construction. It is void of complicated parts that are likely to get out of order.

The success of the valve is due largely to the fact that it holds tight under pressure, when closed, thereby eliminating leakage and consequent air waste; and quickly responds to press of button which freely emits the air.

The Jenkins Renewable Disc specially made for air service, forms a perfect contact on the seat and takes up the wear of frequent usage. A disc gives long service, but can be easily and quickly renewed if necessary.

Each valve is cast of high grade steam bronze, and is carefully finished, assembled, inspected and tested.

Jenkins Air Guns are made in $\frac{1}{4}$ inch size only.

They can be used for $\frac{1}{8}$ inch, $\frac{1}{4}$ inch, $\frac{3}{8}$ inch and $\frac{1}{2}$ inch hose pipe by the use of different hose nipples.

LIST PRICE

Fig. No. 709.....	Each | \$1.65
-------------------	---------------

Prices on Hose Nipple, Fig. No. 709-A, and Special Tip, Fig. No. 709-B, furnished on application.

Order by Figure Number.

STEAM SPECIALTIES, ETC.

*Penberthy Whistles and Whistle Valves**Standard Brass*Whistle with Valve
Fig. No. 409Whistle Valve
Fig. No. 411Whistle without Valve
Fig. No. 410

LIST PRICES—Fig. No. 409

Diameter of Bell Inches	1½	2	2½	3	3½	4	5	6
Pipe Connection Inches	⅜	½	¾	¾	1	1¼	1½	2
Length of Short Bell . . . Inches	3	4	5	6	7	8	10	12
Price, Short Bell Each	\$4.00	\$5.50	\$6.50	\$8.50	\$11.50	\$15.00	\$22.50	\$33.00
Length of Long Bell Inches	4½	6	7½	9	10½	12	15	18
Price, Long Bell Each	4.60	6.15	7.25	9.60	12.80	16.50	25.75	37.50

LIST PRICES—Fig. No. 410

Diameter of Bell Inches	1½	2	2½	3	3½	4	5	6
Pipe Connection Inches	⅜	½	¾	¾	1	1¼	1½	2
Length of Short Bell . . . Inches	3	4	5	6	7	8	10	12
Price, Short Bell Each	\$3.00	\$4.35	\$5.25	\$7.25	\$9.50	\$12.00	\$19.00	\$24.00
Length of Long Bell Inches	4½	6	7½	9	10½	12	15	18
Price, Long Bell Each	3.60	5.00	6.00	8.35	10.80	13.50	22.25	28.50

LIST PRICES—Fig. No. 411

Pipe Connection Inches	⅜	½	¾	1	1¼	1½	2
Price Each	\$2.00	\$2.50	\$3.00	\$3.50	\$5.00	\$6.00	\$9.00

When ordering, specify whether Long or Short Bell is desired, also Diameter of Bell.
Order by Figure Number.

STEAM SPECIALTIES, ETC.

Lunkenheimer Whistles and Whistle ValvesSingle Bell Chime Whistle
without Valve

Fig. No. 448

200 Lbs. Pressure

Diam. of Bells $1\frac{1}{2}$ to 8 inches

Fire Alarm Whistle with Valve

Iron Base—Fig. No. 446

150 Lbs. Pressure

Bronze Base—Fig. No. 163

200 Lbs. Pressure

Diam. of Bells $2\frac{1}{2}$, $3\frac{1}{2}$, 5 and 8 inches

LIST PRICES—Fig. Nos. 448, 446, 163

Diameter of Bell, Inches	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	5	6	8
Connection, Inches	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{1}{2}$	2
No. 448.....Each	\$5.50	\$8.50	\$10.50	\$13.50	\$18.50	\$24.00	\$37.00	\$49.00	\$120.00
No. 446.....Each	.....	.....	.....	.....	31.00	.....	40.00	.....	100.00
No. 163.....Each	.....	.....	24.00	.....	40.00	.....	53.00	.....	120.00

Orders should indicate whether whistles are to be operated by steam or air. An extra charge is made for grinding valves for air service. Specify Whistles by Bell Diameter.

Jenkins Whistle Valves

Fig. No. 121

Made with quick acting spring and lever. Supplied with gland stuffing box which prevents leakage around the spindle. These valves are made of brass, with malleable iron levers.

LIST PRICES

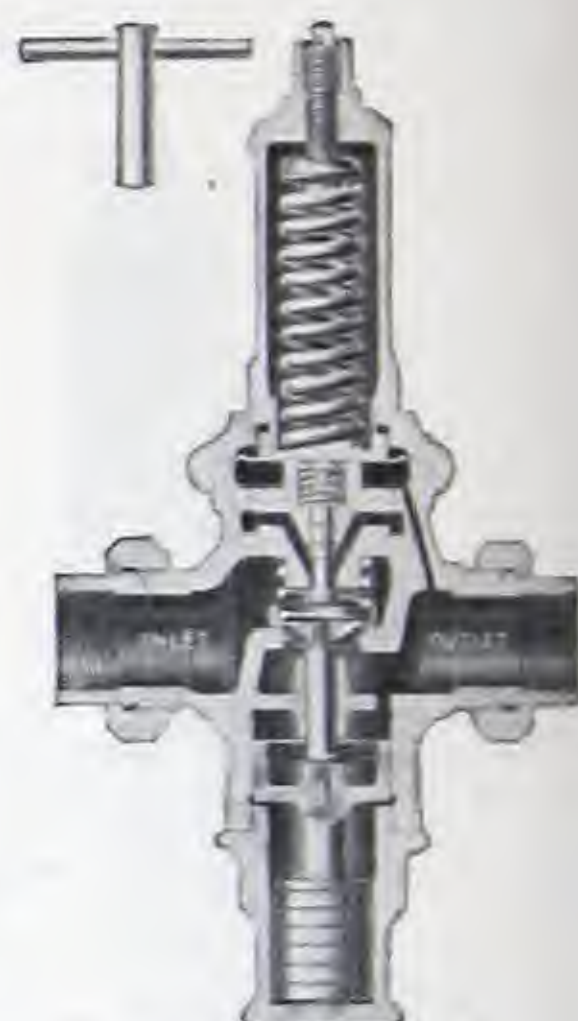
.....Inches	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
No. 121.....Each	\$3.25	\$3.25	\$4.00	\$4.50	\$6.25	\$7.75	\$9.00

Order by Figure Number.

STEAM SPECIALTIES, ETC.

Mason Reducing Valves

For Steam, Air and Water

Reducing Valve
Fig. No. 11For Steam and Air Service
with initial pressures up to
250 Lbs. and reduced
pressures above 5 Lbs.Reducing Valve
Fig. No. 227For Air and Water Service
with initial pressures up to
150 Lbs. and reduced
pressures 10 to 60 Lbs.Reducing Valve
Fig. No. 11
Sectional View

LIST PRICES

Size.....Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Fig. No. 11, Screwed.....Each	32.00	32.00	44.00	55.00	75.00	96.00
Fig. No. 227.....Each	13.00	14.00	16.00	28.00	35.00	.....
Fig. No. 11, Screwed, End to End.....Inches	$5\frac{3}{4}$	$5\frac{3}{4}$	7	8	9	$11\frac{1}{4}$
Size.....Inches	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	5	6
Fig. No. 11 Flgd. (Not Illustrated).....Each	110.00	140.00	180.00	220.00	260.00	375.00
Fig. No. 11 Flgd., Face to Face.....Inches	$8\frac{3}{4}$	$10\frac{1}{4}$	12	14	$15\frac{1}{8}$	$17\frac{1}{8}$

Fig. No. 11 Reducing Valves maintain an even pressure regardless of the variation of initial pressure, or volume of steam or air required. They are ideal for reduced pressure heating systems of all types (vacuum included) engines, paper machines, slashers, dye kettles, etc. The initial pressure must be at least 15 lbs. above the required reduced pressure.

Fig. No. 227 will maintain even pressures of air or water between 10 and 60 lbs., reducing from initial pressures up to 150 lbs. It is recommended for dead end service and is used extensively to reduce high city water pressures to a pressure suitable and economical for domestic use.

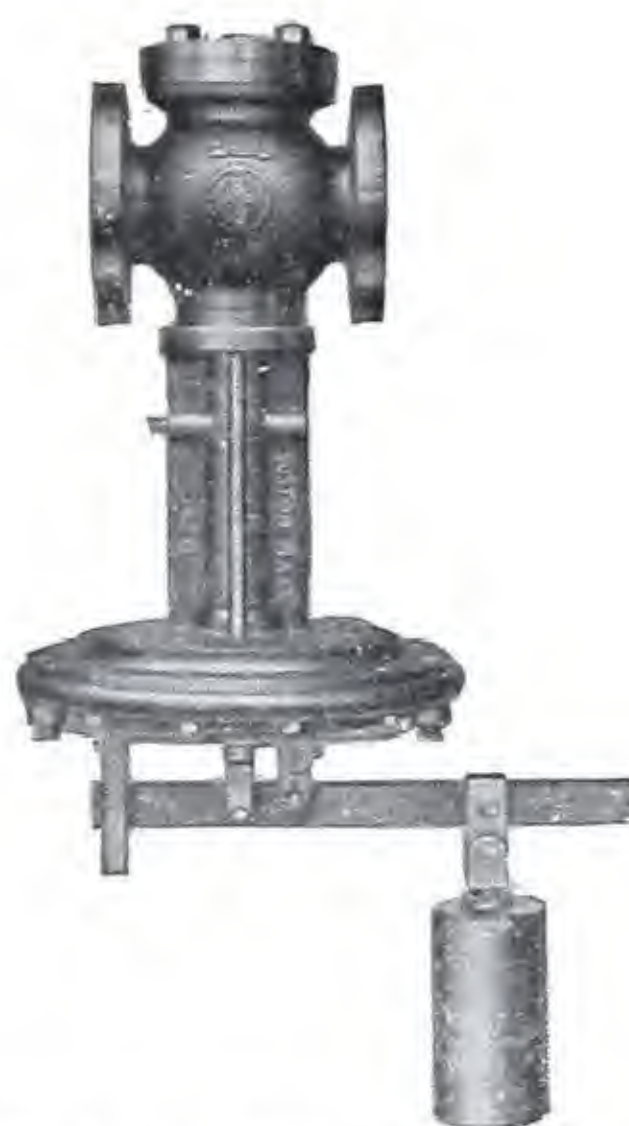
When ordering please state initial and final pressures, i.e., to reduce from what pressure to what pressure.

Order by Figure Number.

STEAM SPECIALTIES, ETC.

*Mason Reducing Valves**For 125 Lbs. Working Steam Pressure*

Reducing Valve, Spring Type
Fig. No. 229



Reducing Valve, Lever Type
Fig. No. 236

LIST PRICES—Fig. No. 229

BRONZE BODY AND PARTS			IRON BODY, BRONZE PARTS	
Size Inches	Tapped Ends	Union Ends	Size Inches	Tapped Ends or Std. Flanges
1/2	\$20.00	\$22.00	2	\$48.00
3/4	22.00	25.00	2 1/2	56.00
1	25.00	29.00	3	66.00
1 1/4	29.00	34.00	3 1/2	76.00
1 1/2	34.00	40.00	4	91.00

LIST PRICES—Fig. No. 236

Size Inches	Iron Body Bronze Parts Flanged	Iron Body Monel Parts Flanged	Size Inches	Iron Body Bronze Parts Flanged	Iron Body Monel Parts Flanged
2	\$72.00	\$88.00	5	\$173.00	\$243.00
2 1/2	80.00	100.00	6	200.00	320.00
3	90.00	115.00	8	345.00	485.00
3 1/2	100.00	135.00	10	555.00	735.00
4	125.00	170.00	.....	.....	.....

Fig. No. 229 Reducing Valve is a direct operated spring resisted regulator designed for installation where accurate regulation of pressure is required and where the initial pressure is below 125 pounds. Springs can be furnished for ranges at 1 to 10 lbs., 8 to 35 lbs., 25 to 90 lbs.

Fig No. 236 Lever Style Reducing Valve is especially designed for the regulation of steam at low pressure. They are regularly made in two sizes of diaphragms for reduced pressure ranges of 0 to 10 lbs. and 5 to 25 lbs.

Order by Figure Number.

STEAM SPECIALTIES, ETC. Morrison Pressure Reducing Valves Full Area Type

Straight Pattern

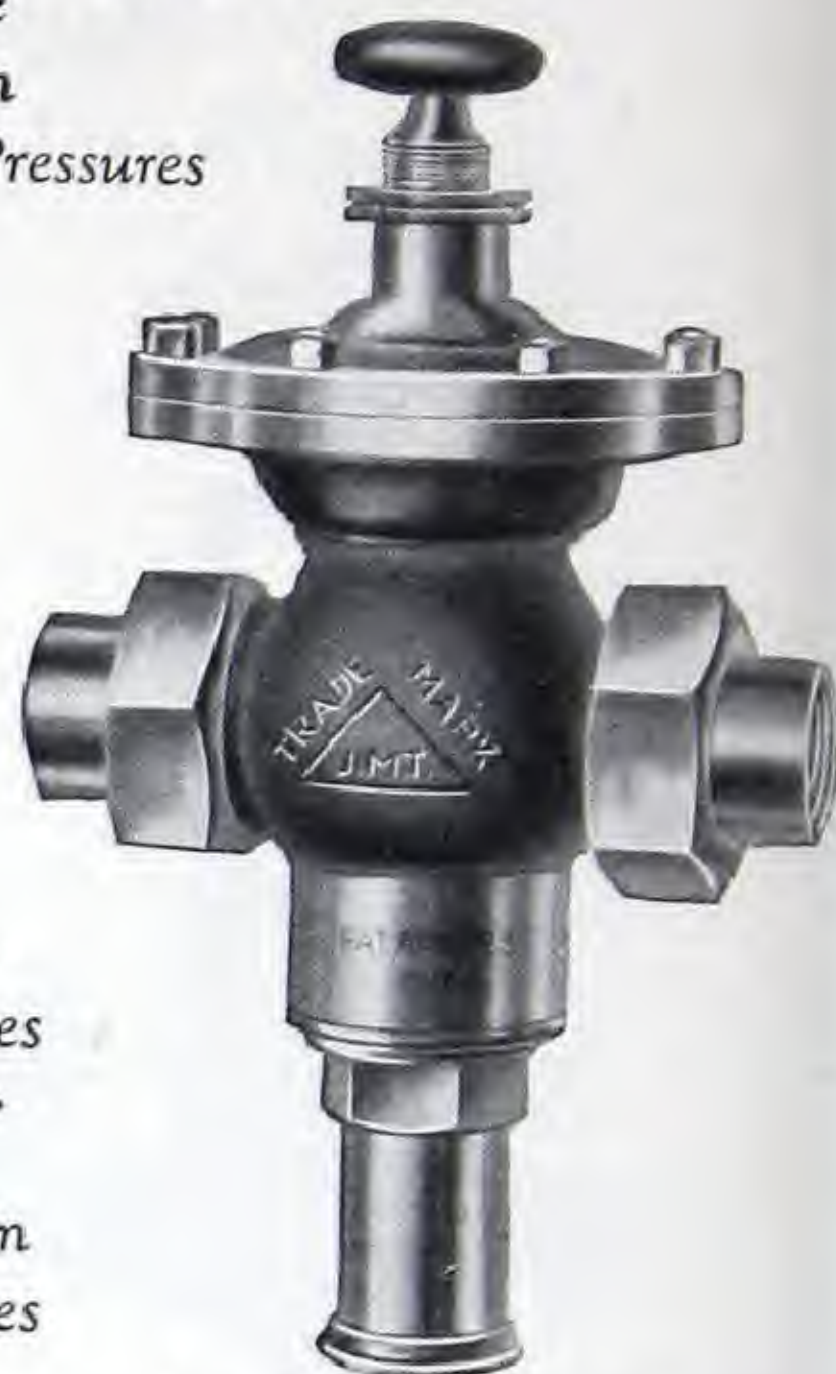
For Initial Steam or Air Pressures
up to 300 Lbs.



Standard Pattern

Screwed—Fig. No. 933

Flanged (Not Ill.)—Fig. No. 934



Low Pressure Pattern

Screwed—Fig. No. 937

Flanged (Not Ill.)—Fig. No. 938

Standard Pattern
For Reduced Pressures
from 10 to 300 Lbs.

Low Pressure Pattern
For Reduced Pressures
up to 10 Lbs.

Bronze Body

Iron Body—Bronze Mounted

Flanged (Not Ill.)—Fig. No. 936

Flanged (Not Ill.)—Fig. No. 939

LIST PRICES—Fig. Nos. 933, 934, 937, 938

Size.....Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Price, Fig. Nos. 933, 934.....Each	\$32.00	\$32.00	\$39.00	\$50.00	\$62.00	\$78.00
Price, Fig. Nos. 937, 938.....Each	47.00	47.00	55.00	65.50	78.00	94.00
Length over Unions.....Inches	$5\frac{3}{4}$	$5\frac{3}{4}$	7	8	9	$11\frac{1}{4}$
Face to Face, Flanged.....Inches	$4\frac{3}{8}$	$4\frac{3}{8}$	$5\frac{3}{4}$	$6\frac{1}{8}$	$7\frac{1}{8}$	$8\frac{1}{2}$
Diameter of Flanges.....Inches	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	6	$6\frac{1}{2}$

LIST PRICES—Fig. Nos. 936, 939

Size.....Inches	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	5	6
Price, Fig. No. 936.....Each	\$96.00	\$122.00	\$144.00	\$168.00	\$228.00	\$304.00
Price, Fig. No. 939.....Each	112.00	137.50	158.50	184.00	244.00	320.00
Face to Face, Flanged.....Inches	$8\frac{3}{4}$	$10\frac{1}{4}$	12	14	$15\frac{1}{8}$	$17\frac{1}{8}$
Diameter of Flanges.....Inches	$7\frac{1}{2}$	$8\frac{1}{4}$	9	10	11	$12\frac{1}{2}$

Any of the above valves can also be furnished fitted with Lock Shield and Loose Key at the same List Prices.

These valves are Government Approved.

A Strainer should be installed on High Pressure Line immediately ahead of Reducing Valve; the Valves are guaranteed by Manufacturer only when Strainer is used.

For Strainers, see page 665.

Enlarged Outlet Pattern can also be furnished. Prices on application.

When ordering state initial and final pressures, i.e., to reduce from what pressure to what pressure.

Order by Figure Number.

STEAM SPECIALTIES, ETC.

*Morrison Water Pressure Reducing Valves**125 Lbs. Water Pressure*

Water Pressure Reducing Valve
Fig. No. 1590

Size Inches	Price Each	End to End Screwed Inches	Diameter of Diaphragm	Height Over all	Approximate Weight
$\frac{1}{2}$	\$21.00	$3\frac{1}{16}$	$7\frac{1}{2}$	8	10
$\frac{3}{4}$	21.00	$3\frac{1}{16}$	$7\frac{1}{2}$	8	10
1	24.00	$3\frac{5}{8}$	$7\frac{1}{2}$	$9\frac{1}{2}$	$12\frac{1}{4}$

These valves are for use in reducing and controlling water pressure where very uniform pressure is required and are so designed that a variation of the pressure in the supply line does not affect the pressure on the low pressure side of reducing valve. They are of the double seat type and suitable for any initial pressure up to 125 lbs., and any reduced pressure up to 40 lbs.

When ordering state what pressures valve is required for.

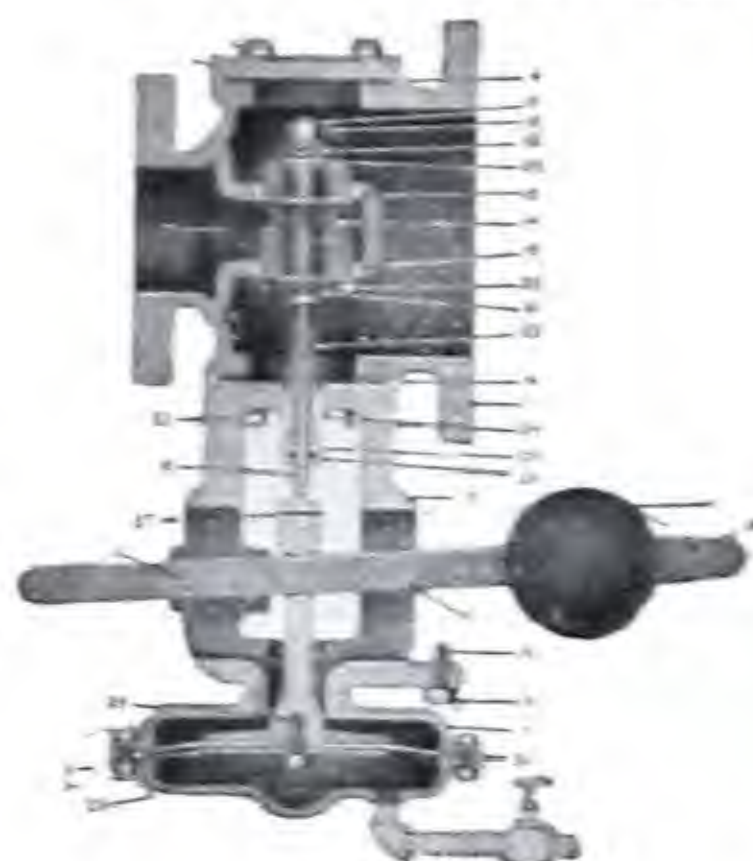
Order by Figure Number.

STEAM SPECIALTIES, ETC.
Kieley Special 98 Vacuum Pressure
Regulating Valves

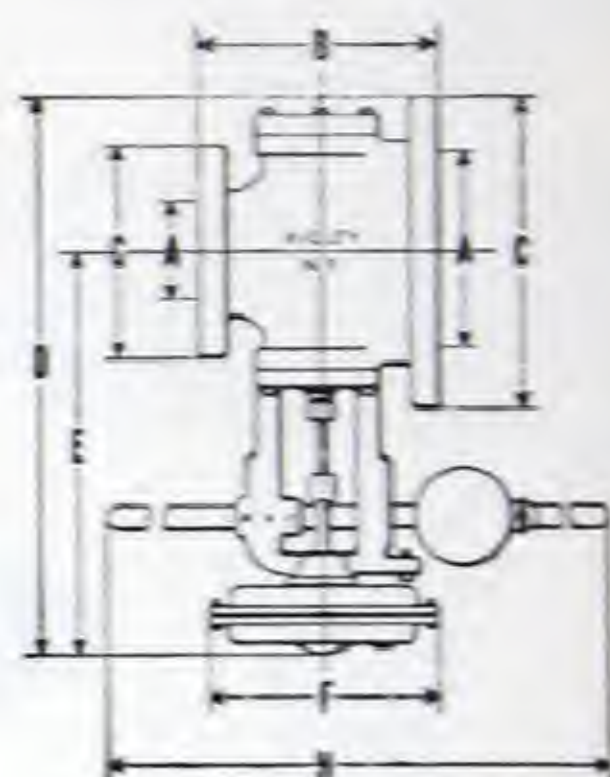
Iron Body

Bronze Seats and Discs

For Steam Pressures up to 125 Pounds



Pressure Regulating Valve
Fig. No. 100



LIST PRICES—Fig. No. 100

With Increased Outlet Size Inches	Price Each	DIMENSIONS							
		A	B	C Outlet	D	E	F	G Inlet	H
1 x2	\$33.00	1 x2	6 1/8	3 1/4	20 3/4	16 3/4	12	3 1/4	42
1 1/4 x2 1/2	42.50	1 1/4 x2 1/2	7 3/8	7	21	17 1/4	12	3 1/4	42
1 1/2 x3	53.50	1 1/2 x3	7 3/8	7 1/2	21 1/8	17 1/4	12	3 1/4	42
2 x4	72.00	2 x4	7 3/4	9	21 1/8	17 1/4	12	3 1/2	42
2 1/2 x5	96.00	2 1/2 x5	8 1/4	10	21 1/2	17 1/2	12	7	42
3 x6	126.00	3 x6	8 1/8	11	22 1/2	18	12	7 1/2	42
4 x6	140.00	4 x6	11 1/4	11	24 3/4	18 1/2	12	9	42
4 x8	187.50	4 x8	10 7/8	13 1/2	25 3/8	18 3/8	12	9	42
5 x10	242.00	5 x10	11 5/8	16	28 1/4	20 1/4	12	10	42
6 x12	325.00	6 x12	13 1/4	19	29	19 1/2	12	11	42
8 x14	400.00	8 x14	14 3/4	21	32 3/4	21 5/8	12	13 1/6	42
8 x16	500.00	8 x16	15	23 1/2	33 7/8	22 1/8	12	13 1/2	42

Dimension "F" varies according to pressure. Size 1 x 2 made with screw ends only. Sizes 1 1/4 x 2 1/2 up to 2 x 4 are made with small ends screwed and large ends flanged. All other sizes above 2 x 4 have both ends flanged. Flanges drilled American Standard. Fig. No. 100 is a double seated valve for use in connection with vacuum or vapor systems or other services where close regulation is necessary. They are not suitable for reducing against a dead end. For this service use the single seated valve.

When ordering state initial and final pressures, i.e., to reduce from what pressure to what pressure.

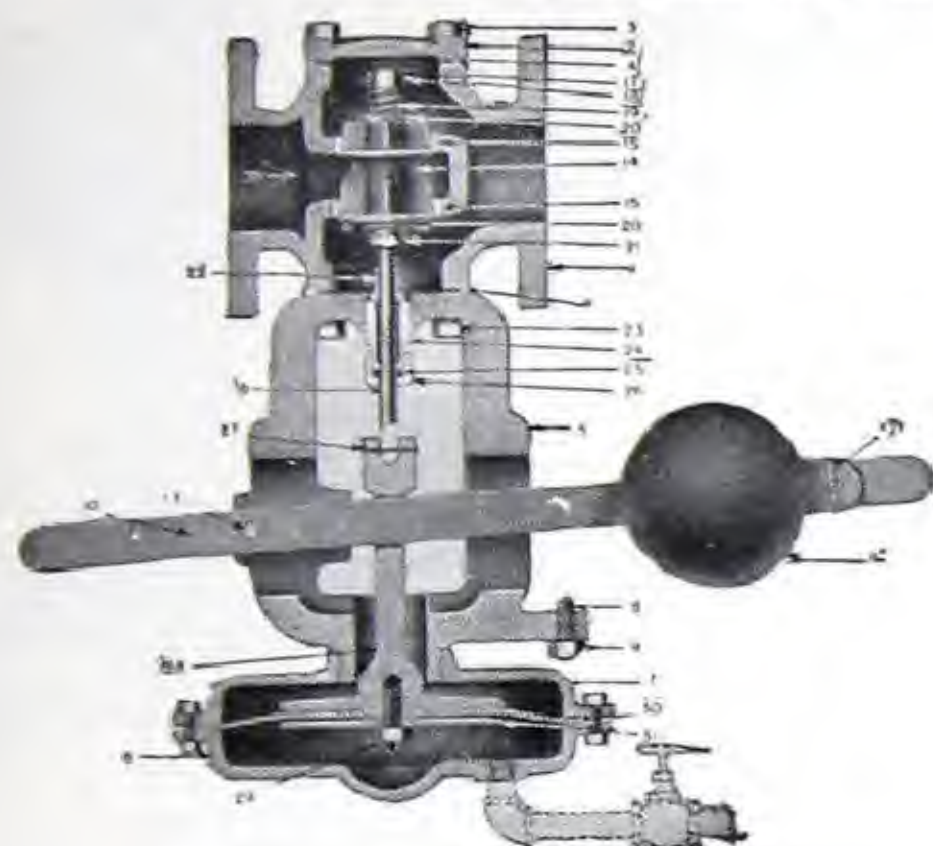
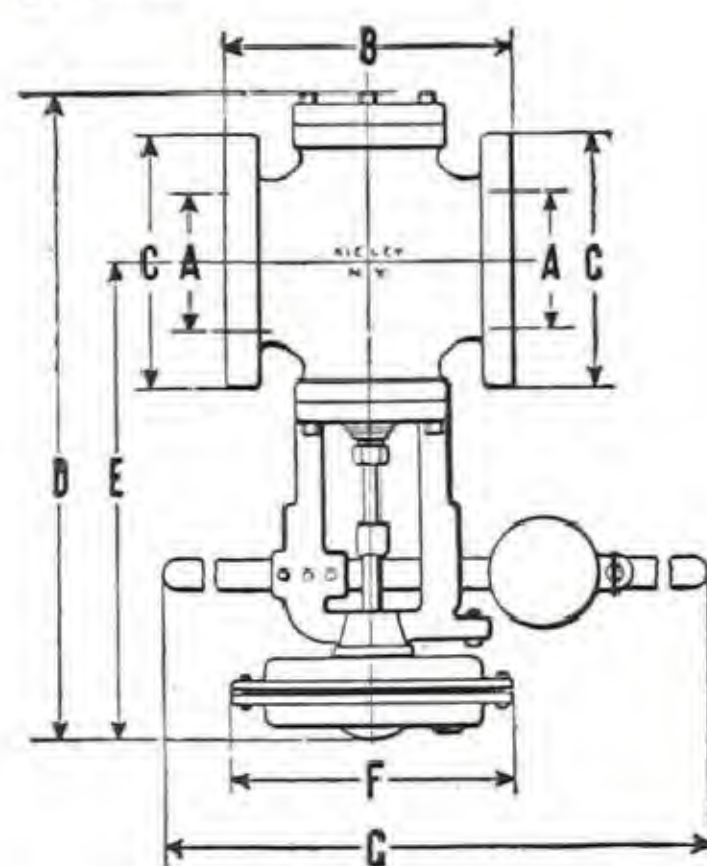
Order by Figure Number.

STEAM SPECIALTIES, ETC.

Kieley Special 98 Vacuum Pressure Regulating Valves

Bronze Seats and Discs

For Steam Pressure up to 125 Lbs.

Pressure Regulating Valve
Fig. No. 102

LIST PRICES—Fig. No. 102 (Screwed)

Both Ends Same Size Inches	Price Screw Each	DIMENSIONS						
		A	B	C	D	E	F	G
* $\frac{3}{4}$	\$20.00	$\frac{3}{4}$	$3\frac{1}{2}$	$1\frac{7}{8}$	$16\frac{9}{16}$	$15\frac{1}{8}$	12	42
*1	22.00	1	$3\frac{3}{4}$	$2\frac{1}{8}$	17	$15\frac{1}{2}$	12	42
* $1\frac{1}{4}$	28.00	$1\frac{1}{4}$	$4\frac{1}{8}$	$2\frac{3}{8}$	17	$15\frac{1}{4}$	12	42
* $1\frac{1}{2}$	35.00	$1\frac{1}{2}$	$4\frac{3}{8}$	$2\frac{1}{2}$	$17\frac{3}{8}$	$15\frac{3}{8}$	12	42
*2	44.00	*2	$5\frac{3}{4}$	3	18	$15\frac{3}{4}$	12	42
†2	44.00	†2	$6\frac{1}{16}$	$3\frac{3}{8}$	$20\frac{5}{8}$	$16\frac{3}{4}$	12	42
† $2\frac{1}{2}$	57.00	$2\frac{1}{2}$	$7\frac{5}{8}$	$4\frac{1}{8}$	$21\frac{1}{8}$	$17\frac{1}{2}$	12	42
†3	72.00	3	$8\frac{1}{2}$	$5\frac{1}{8}$	$22\frac{3}{4}$	$18\frac{3}{16}$	12	42
† $3\frac{1}{2}$	85.00	$3\frac{1}{2}$	$9\frac{5}{8}$	$5\frac{5}{8}$	$22\frac{7}{8}$	$18\frac{3}{8}$	12	42
†4	100.00	4	$10\frac{1}{2}$	$6\frac{1}{2}$	$24\frac{1}{2}$	$18\frac{1}{2}$	12	42

LIST PRICES—Fig. No. 102 (†Flanged)

Both Ends Same Size Inches	Price Flanged Each	DIMENSIONS						
		A	B	C	D	E	F	G
2	\$50.00	2	$7\frac{1}{16}$	6	21	$16\frac{3}{4}$	12	42
$2\frac{1}{2}$	57.00	$2\frac{1}{2}$	$7\frac{9}{16}$	7	$21\frac{1}{8}$	$16\frac{7}{8}$	12	42
3	72.00	3	$8\frac{1}{2}$	$7\frac{1}{2}$	$22\frac{1}{8}$	18	12	42
$3\frac{1}{2}$	85.00	$3\frac{1}{2}$	$9\frac{3}{4}$	$8\frac{1}{2}$	$23\frac{3}{8}$	$18\frac{3}{8}$	12	42
4	100.00	4	$10\frac{7}{8}$	9	$24\frac{1}{4}$	$19\frac{3}{8}$	12	42
5	135.00	5	$11\frac{7}{8}$	10	$25\frac{1}{8}$	$19\frac{1}{2}$	12	42
6	180.00	6	$12\frac{7}{8}$	11	$26\frac{3}{8}$	$19\frac{5}{8}$	12	42
7	225.00	7	$13\frac{1}{2}$	$12\frac{1}{2}$	28	20	12	42
8	275.00	8	$14\frac{7}{8}$	$13\frac{1}{2}$	29	$20\frac{3}{4}$	12	42
10	350.00	10	$16\frac{7}{8}$	16	$31\frac{5}{8}$	$22\frac{1}{8}$	12	42
12	470.00	12	$18\frac{3}{8}$	19	$38\frac{1}{2}$	$28\frac{1}{8}$	12	42

*Bronze Body. † Iron Body.

Fig. No. 102 is a double seated valve for use in connection with vacuum or vapor systems, or other services where close regulation is necessary. They are not suitable for reducing against a dead end. For such service use a single seated valve.

When ordering state initial and final pressures, i.e., to reduce from what pressure to what pressure.

Flanges drilled American Standard.

Order by Figure Number.

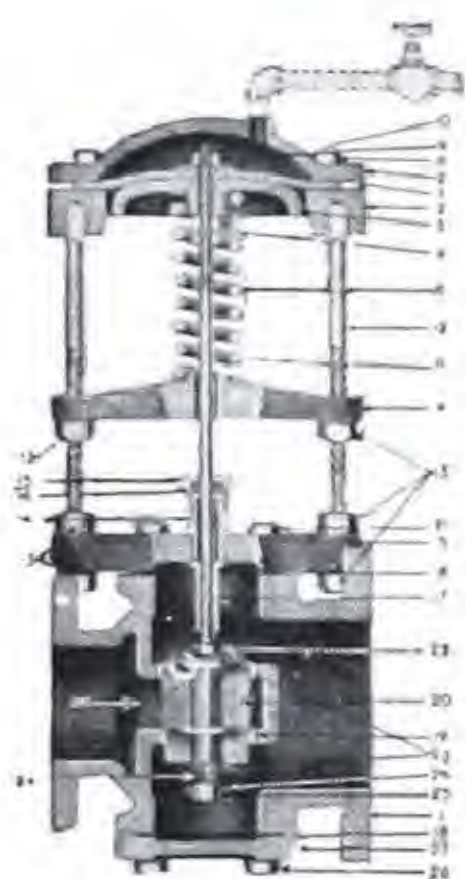
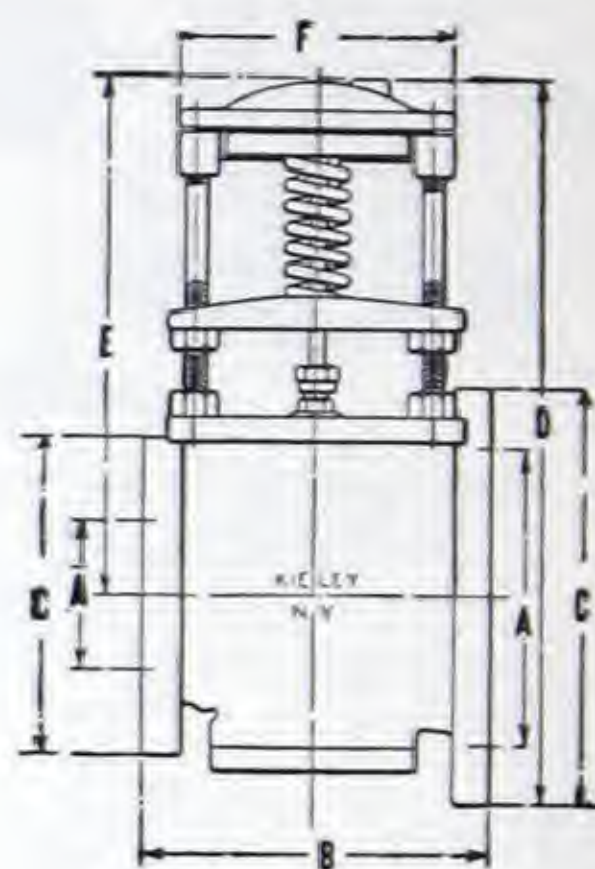
STEAM SPECIALTIES, ETC.

Kieley Rockaway Double Seated Pressure
Regulating Valves

Iron Body

Bronze Seats and Discs

For Steam Pressures up to 125 Lbs.

Pressure Regulating Valve
Fig. No. 124

LIST PRICES—Fig. No. 124

With Increased Outlet Size Inches	Price Each	DIMENSIONS						
		A	B	C	D	E	F	G
1 x2	\$33.00	1 x2	6 $\frac{1}{8}$	3 $\frac{3}{4}$	22 $\frac{3}{4}$	19	10 $\frac{3}{4}$	3 $\frac{3}{4}$
1 $\frac{1}{4}$ x2 $\frac{1}{2}$	42.50	1 $\frac{1}{4}$ x2 $\frac{1}{2}$	7 $\frac{3}{8}$	7	22 $\frac{3}{4}$	19	10 $\frac{3}{4}$	3 $\frac{3}{4}$
1 $\frac{1}{2}$ x3	53.50	1 $\frac{1}{2}$ x3	7 $\frac{3}{8}$	7 $\frac{1}{2}$	22 $\frac{3}{4}$	19	10 $\frac{3}{4}$	3 $\frac{3}{4}$
2 x4	72.00	2 x4	7 $\frac{5}{8}$	9	23 $\frac{1}{4}$	19	10 $\frac{3}{4}$	4
2 $\frac{1}{2}$ x5	96.00	2 $\frac{1}{2}$ x5	8 $\frac{1}{4}$	10	24 $\frac{1}{4}$	19	10 $\frac{3}{4}$	7
3 x6	126.00	3 x6	9	11	25	20	10 $\frac{3}{4}$	7 $\frac{1}{2}$
4 x6	140.00	4 x6	11 $\frac{1}{4}$	11	25 $\frac{1}{2}$	20	10 $\frac{3}{4}$	9
4 x8	187.50	4 x8	11	13 $\frac{1}{2}$	27	20 $\frac{1}{2}$	10 $\frac{3}{4}$	9
5 x10	242.00	5 x10	12	16	29	21 $\frac{1}{2}$	10 $\frac{3}{4}$	10
6 x12	325.00	6 x12	13 $\frac{1}{4}$	19	31	22	10 $\frac{3}{4}$	11
8 x14	400.00	8 x14	14 $\frac{3}{4}$	21	32 $\frac{1}{2}$	22 $\frac{1}{2}$	10 $\frac{3}{4}$	13 $\frac{1}{2}$
8 x16	500.00	8 x16	15	23 $\frac{1}{2}$	34	22 $\frac{1}{2}$	10 $\frac{3}{4}$	13 $\frac{1}{2}$

Dimension "F" varies according to pressures. Size 1 x 2 made with screwed ends only. Sizes 1 $\frac{1}{4}$ x2 $\frac{1}{2}$ to 2 x 4 inclusive are made with small ends screwed and large ends flanged. Sizes above 2 x 4 are made flanged both ends. Flanges drilled American Standard.

Fig. No. 124 is for use in regulating and controlling steam pressures for any and all services where close regulation is desired, not including dead end service. For dead end service use a single seated valve.

When ordering state initial and final pressures, i.e., to reduce from what pressure to what pressure.

Fig. No. 124 can be furnished Extra Heavy at a slight additional cost.

Order by Figure Number.

STEAM SPECIALTIES, ETC.

Dunham Double Seated Reducing Pressure Valves

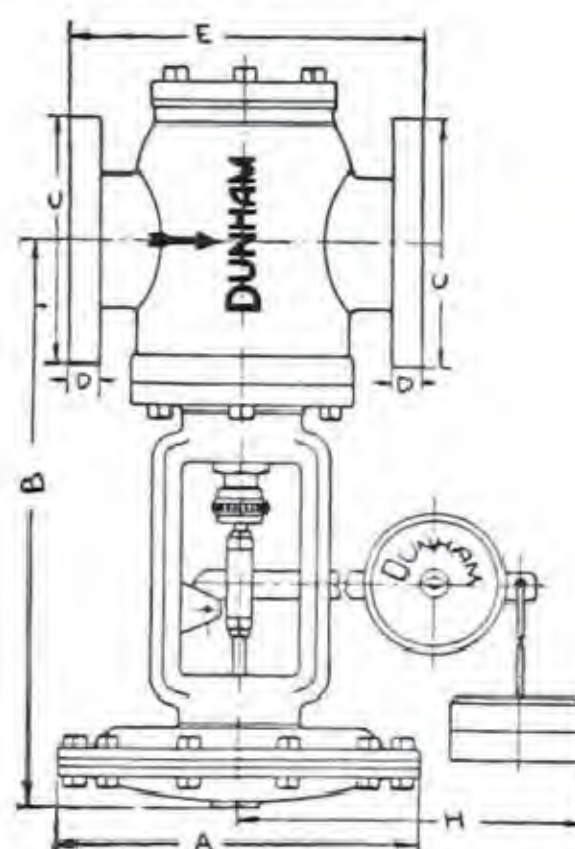
Iron Body
Bronze Seats and Discs

Reducing Pressure Valve
Straight Pattern

Fig. No. 300

For Initial Pressures
Standard—up to 125 Lbs.
Extra Heavy—up to 250 Lbs.

For Reduced Pressures
Diaphragm Type—1 to 80 Lbs.
Cylinder Type—80 to 150 Lbs.



LIST PRICES—Fig. No. 300 (STANDARD)

Pipe Size Inches	List Prices		Dimensions in Inches						
	Screwed	Flanged	A	B	C	D	E		H
3/4	\$30.00	.....	Various diameter to suit range of reduced pressures required.	10	...	...	5 1/8	...	27
1	35.00	.....		15	...	...	6	...	27
1 1/4	40.00	.....		15	...	...	6	...	27
1 1/2	45.00	\$ 45.00		16 1/2	5	9/16	7	7 3/4	27
2	55.00	55.00		17	6	5/8	8 3/16	8 3/8	27
2 1/2	60.00	65.00		17 1/2	7	11/16	9	8 7/8	27
3	.....	80.00		18 1/4	7 1/2	3/4	...	10 1/4	27
3 1/2	.....	95.00		18 1/4	8 1/2	13/16	...	10 3/8	27
4	.....	110.00		19 1/4	9	1 1/16	...	12	27
5	.....	135.00		20 1/4	10	1 1/8	...	12 3/4	27
6	.....	180.00		21	11	1 1/8	...	14 1/2	27
8	.....	250.00		23	13 1/2	1 1/8	...	18 1/4	27

LIST PRICES—Fig. No. 300 (EXTRA HEAVY)

Pipe Size Inches	List Prices Flanged	Dimensions in Inches					
		A	B	C	D	E	H
1 1/2	\$ 47.50	Various diameter to suit range of reduced pressures required.	16 1/2	6	1 3/8	8 1/4	27
2	57.50		17	6 1/2	7/8	8 7/8	27
2 1/2	70.00		17 1/2	7 1/2	1	9 1/2	27
3	85.00		18 1/4	8 1/4	1 1/8	11	27
3 1/2	100.00		18 1/4	9	1 3/16	11 1/8	27
4	120.00		19 1/4	10	1 1/4	12 5/8	27
5	150.00		20 1/4	11	1 3/8	13 5/8	27
6	200.00		21	12 1/2	1 7/8	15 3/8	27
8	275.00		23	15	1 5/8	19 1/4	27

The Dunham Reducing Pressure Valve is an automatic valve to reduce steam, air or water from an initial high pressure to any lower delivery pressure. It is applicable to a wide range of pressure service.

Yoke and Lever may be turned through 360° to avoid obstacles.

When ordering state initial and reduced pressures, i.e., to reduce from what pressure to what pressure. Specify Type and Service. If character of Service is not stated, valves will be supplied for steam service.

See following page for Expanded Outlet Pattern.

Order by Figure Number.

STEAM SPECIALTIES, ETC.

Dunham Double Seated Reducing Pressure Valves

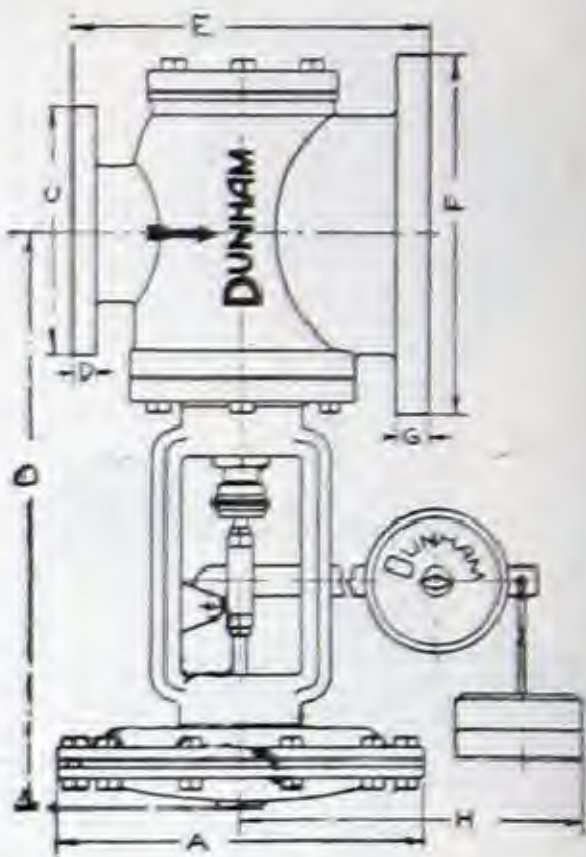
Iron Body
Bronze Seats and Discs



Reducing Pressure Valve
Expanded Outlet Pattern
Fig. No. 310

For Initial Pressures
Standard—up to 125 Lbs.
Extra Heavy—up to 250 Lbs.

For Reduced Pressures
Diaphragm Type—1 to 80 Lbs.
Cylinder Type—80 to 150 Lbs.



LIST PRICES—Fig. No. 310 (STANDARD)

Pipe Size Inches	List Prices		Dimensions in Inches								
	Screwed	Flanged	A	B	C	D	E		F	G	H
							Scrd.	Flgd.			
1 x 2	\$37.50	.....	To suit pressures required.	15	.....	.....	6 1/4	.....	.....	.....	27
1 1/4 x 2 1/2	40.00	.....		15	.....	.....	6 3/8	.....	.....	.....	27
1 1/2 x 3	47.50	\$50.00		16 1/2	5	9/16	7 1/2	8 1/16	7 1/2	3/4	27
2 x 4	.....	60.00		17	6	5/8	.....	8 1/16	9	15/16	27
2 1/2 x 5	.....	75.00		17 1/2	7	11/16	.....	9 3/16	10	15/16	27
3 x 6	.....	85.00		18 1/4	7 1/2	3/4	.....	10 3/4	11	1	27
3 1/2 x 7	.....	110.00		18 1/4	8 1/2	13/16	.....	10 7/8	12 1/2	1 1/16	27
4 x 8	.....	120.00		19 1/4	9	15/16	.....	12 1/2	13 1/2	1 1/8	27
5 x 10	.....	160.00		20 1/4	10	1 1/8	.....	13 1/8	16	1 3/16	27
6 x 12	.....	200.00		21	11	1	.....	14 3/4	19	1 1/4	27
8 x 16	.....	300.00		23	13 1/2	1 1/8	.....	18 3/4	23 1/2	1 7/8	27

LIST PRICES—Fig. No. 310 (EXTRA HEAVY)

Pipe Size Inches	List Prices	Dimensions in Inches							
	Flanged	A	B	C	D	E	F	G	H
1½ x 3	\$52.50	To suit pressures required.	16½	6	13⁄16	8 5⁄16	7½	¾	27
2 x 4	62.50		17	6½	7⁄8	8 15⁄16	9	15⁄16	27
2½ x 5	80.00		17½	7½	1	9½	10	15⁄16	27
3 x 6	90.00		18¼	8¼	1 1⁄8	11 1⁄8	11	1	27
3½ x 7	115.00		18¼	9	1 3⁄16	11 ¼	12½	1 1⁄16	27
4 x 8	130.00		19¼	10	1 ¼	12 13⁄16	13½	1 1⁄8	27
5 x 10	175.00		20¼	11	1 3⁄8	13 9⁄16	16	1 3⁄16	27
6 x 12	220.00		21	12½	1 7⁄8	15 3⁄16	19	1 ¼	27
8 x 16	325.00	23	15	1 5⁄8	19	23½	1 7⁄8	27	

The Dunham Reducing Pressure Valve is an automatic valve to reduce steam, air or water from an initial high pressure to any lower delivery pressure. It is applicable to a wide range of pressure service.

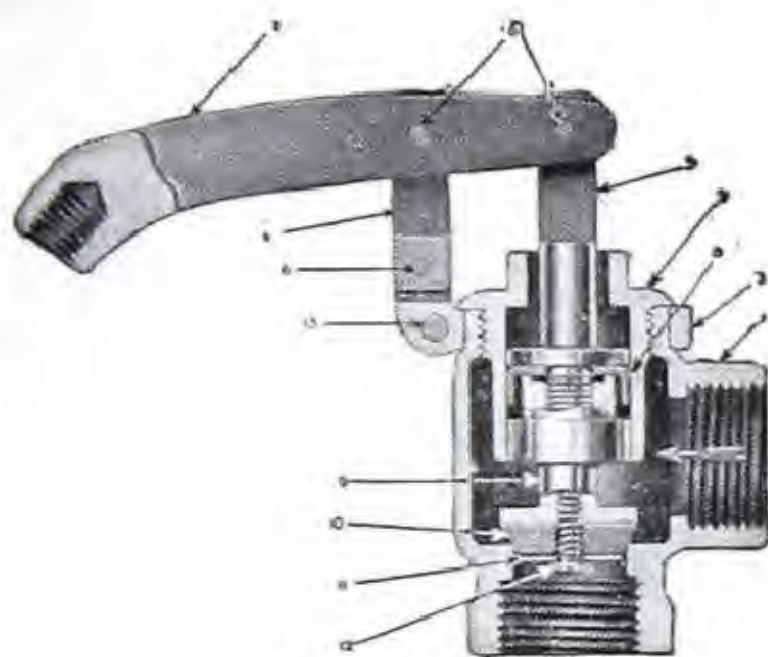
Yoke and Lever may be turned through 360° to avoid obstacles.

When ordering state initial and reduced pressures, i.e., to reduce from what pressure to what pressure. Specify Type and Service. If character of Service is not stated, valves will be supplied for steam service.

See preceding page for Straight Size Pattern.

Order by Figure Number.

STEAM SPECIALTIES, ETC.

*Kieley Float Valves***Bronze Body—Composition Disc****For Water Pressures up to 100 Lbs.**

Float Valve

Angle—Fig. No. 232

Globe (Not Illustrated) —

Fig. No. 230

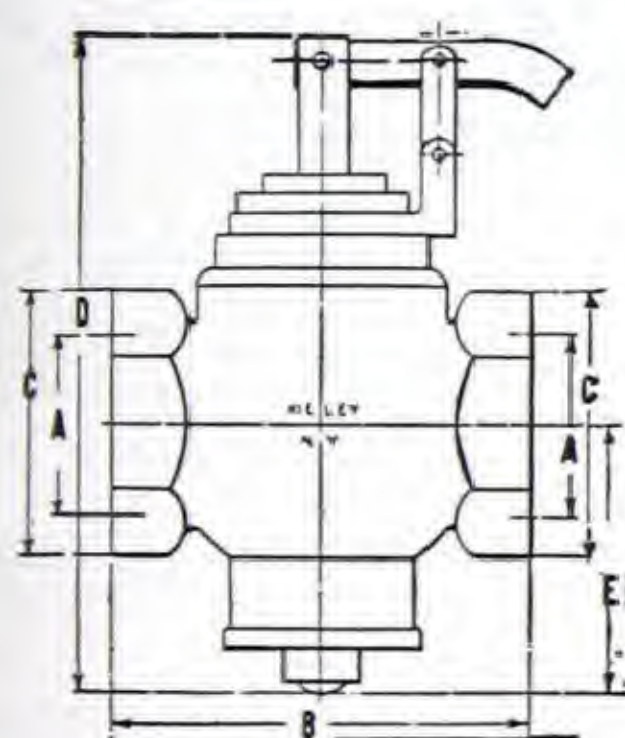


Fig. No. 230

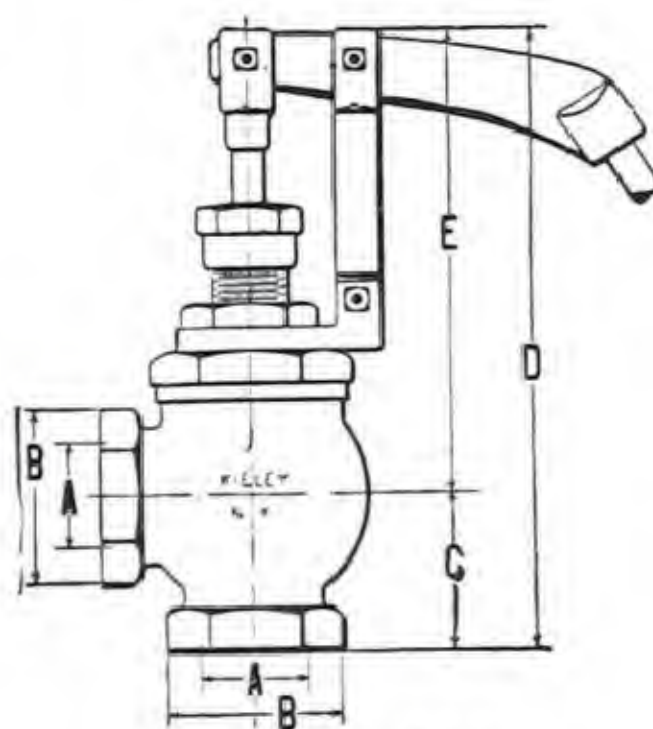


Fig. No. 232

GLOBE SCREWED—Fig. No. 230

Size Inches	Price Each	DIMENSIONS				
		A	B	C	D	E
$\frac{3}{4}$	\$10.00	$\frac{3}{4}$	$3\frac{3}{8}$	2	$5\frac{1}{4}$	2
1	10.00	1	$3\frac{3}{8}$	2	$5\frac{1}{4}$	2
$1\frac{1}{4}$	12.00	$1\frac{1}{4}$	$4\frac{1}{8}$	$2\frac{3}{4}$	$6\frac{5}{8}$	$2\frac{1}{2}$
$1\frac{1}{2}$	15.00	$1\frac{1}{2}$	$4\frac{1}{8}$	$2\frac{3}{4}$	$6\frac{5}{8}$	$2\frac{1}{2}$
2	20.00	2	$5\frac{1}{4}$	$3\frac{1}{4}$	$7\frac{3}{4}$	$3\frac{1}{4}$

ANGLE SCREWED—Fig. No. 232

Size Inches	Price Each	DIMENSIONS					
		A	B	C	D	E	F
$\frac{3}{4}$	\$10.00	$\frac{3}{4}$	2	$1\frac{5}{8}$	$4\frac{7}{8}$	$3\frac{1}{4}$	$1\frac{3}{4}$
1	10.00	1	2	$1\frac{5}{8}$	$4\frac{7}{8}$	$3\frac{1}{4}$	$1\frac{3}{4}$
$1\frac{1}{4}$	12.00	$1\frac{1}{4}$	$2\frac{3}{4}$	$2\frac{1}{8}$	$5\frac{3}{4}$	$3\frac{5}{8}$	$2\frac{1}{4}$
$1\frac{1}{2}$	15.00	$1\frac{1}{2}$	$2\frac{3}{4}$	$2\frac{1}{8}$	$5\frac{3}{4}$	$3\frac{5}{8}$	$2\frac{1}{4}$
2	20.00	2	$3\frac{1}{4}$	$2\frac{5}{8}$	$6\frac{7}{8}$	$4\frac{1}{4}$	$2\frac{7}{8}$

List prices include float and float rod.

These valves are used to control the make up water in open tanks, reservoirs, towers, etc., and maintain a constant water line regardless of pressure in supply line. To regulate valve it is only necessary to cut arm to which float is attached to the proper length.

When ordering state kind of service, initial water pressure and what variation in water level in tank you require.

Order by Figure Number.

STEAM SPECIALTIES, ETC.

Kieley Hot Water Float Valves

Bronze Body

Composition Mounted

For Hot Water Pressures up to 200 Lbs.

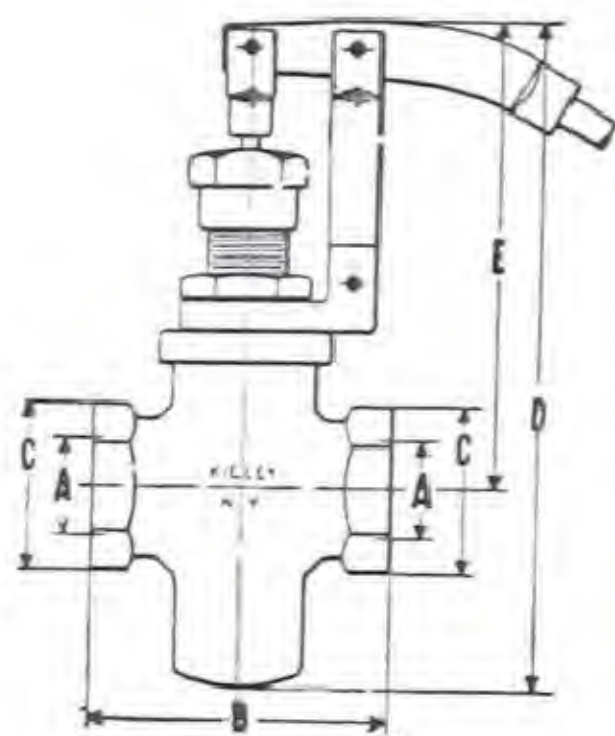
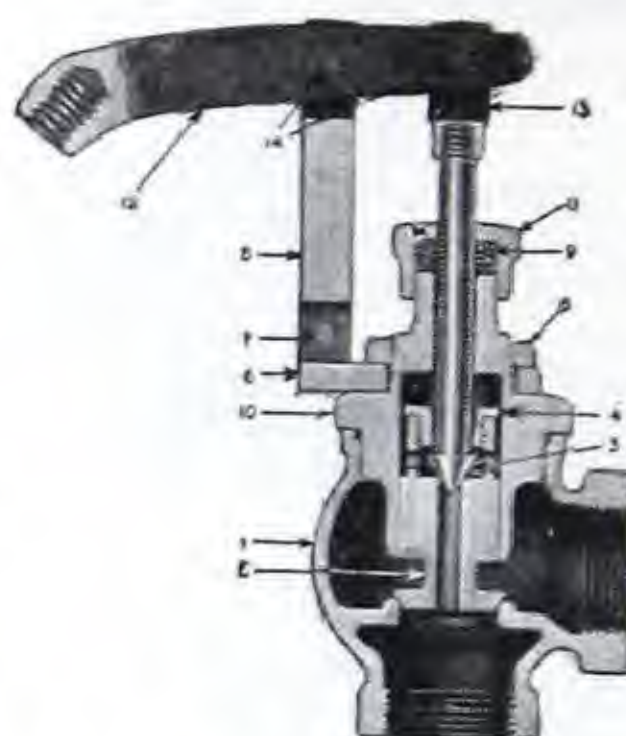


Fig. No. 244



Hot Water Float Valve
Angle—Fig. No. 246
Globe (Not Ill.)
Fig. No. 244

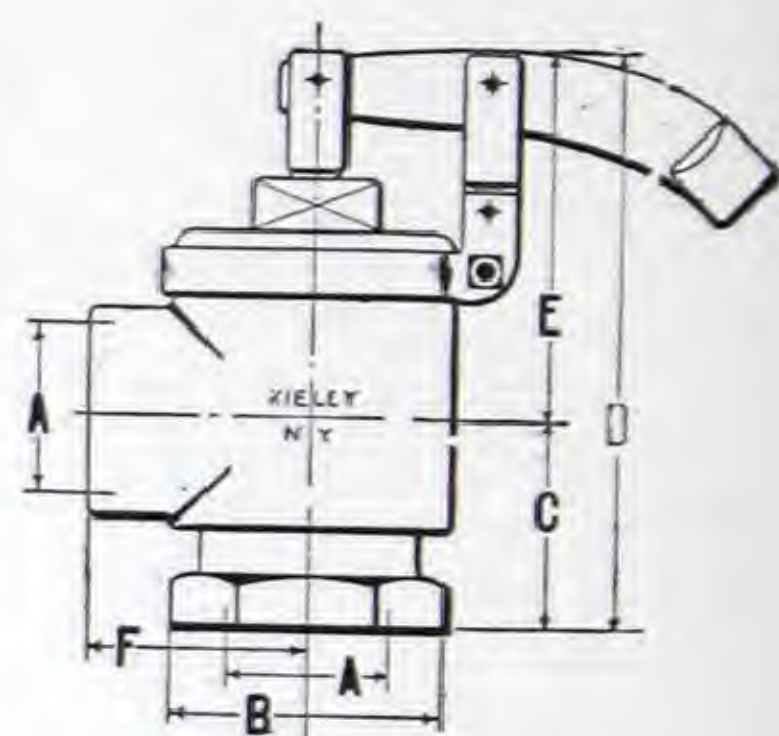


Fig. No. 246

GLOBE—Fig. No. 244

Size Inches	Price Each	DIMENSIONS				
		A	B	C	D	E
$\frac{3}{4}$	\$25.00	$\frac{3}{4}$	$3\frac{1}{4}$	$1\frac{3}{8}$	8	$5\frac{3}{4}$
1	27.50	1	$4\frac{1}{4}$	$2\frac{3}{8}$	$8\frac{3}{4}$	$6\frac{7}{8}$
$1\frac{1}{4}$	32.50	$1\frac{1}{4}$	$4\frac{1}{4}$	$2\frac{1}{2}$	9	$6\frac{1}{4}$
$1\frac{1}{2}$	37.50	$1\frac{1}{2}$	$4\frac{1}{4}$	$2\frac{5}{8}$	$9\frac{1}{8}$	$6\frac{1}{4}$
2	50.00	2	5	$3\frac{5}{8}$	$10\frac{1}{4}$	$6\frac{3}{4}$
$2\frac{1}{2}$	60.00	$2\frac{1}{2}$	6	4	$10\frac{1}{2}$	7

ANGLE—Fig. No. 246

Size Inches	Price Each	DIMENSIONS				
		A	B	C	D	E
$\frac{3}{4}$	\$25.00	$\frac{3}{4}$	$1\frac{3}{8}$	$1\frac{5}{8}$	8	$6\frac{3}{8}$
1	27.50	1	$2\frac{3}{8}$	$2\frac{1}{8}$	$8\frac{3}{4}$	$6\frac{5}{8}$
$1\frac{1}{4}$	32.50	$1\frac{1}{4}$	$2\frac{1}{2}$	$2\frac{1}{8}$	9	$6\frac{7}{8}$
$1\frac{1}{2}$	37.50	$1\frac{1}{2}$	$2\frac{5}{8}$	$2\frac{1}{8}$	$9\frac{1}{8}$	7
2	50.00	2	$3\frac{5}{8}$	$2\frac{1}{2}$	$10\frac{1}{4}$	$7\frac{3}{4}$
$2\frac{1}{2}$	60.00	$2\frac{1}{2}$	4	3	$10\frac{1}{2}$	$7\frac{1}{2}$

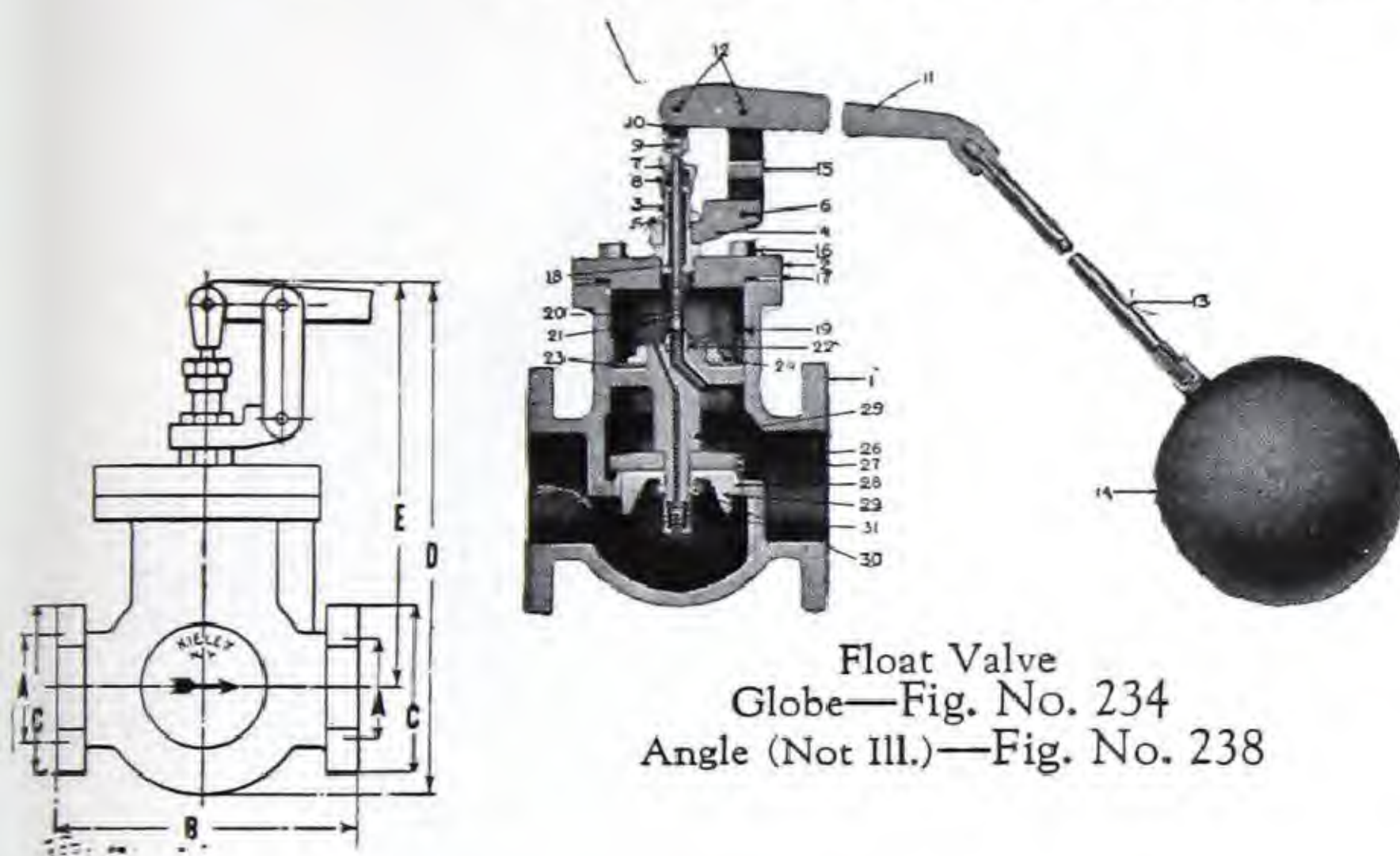
Made in screwed ends only. List prices include seamless copper float and float rod. These valves are suitable for any hot water service, such as maintaining water lines in tanks, cisterns or feed water heaters. Their construction is of the semi-balanced type which means that the float has very little work to do to open or close the valve. When ordering state service valve is to perform, temperature and pressure of water in supply line, also in tank or heater where valve is to be placed and size of manhole. Order by Figure Number.

STEAM SPECIALTIES, ETC.
Kieley Swivel Automatic Piston Actuated
Float Valves

Iron Body

Bronze Mounted

For Cold Water Pressure up to 200 Lbs.



Float Valve
Globe—Fig. No. 234
Angle (Not Ill.)—Fig. No. 238

Fig. No. 234

Fig. No. 238

GLOBE, FLANGED—Fig. No. 234

Size Inches	Price Each	DIMENSIONS				
		A	B	C	D	E
2	\$20.00	2	7 ³ / ₈	6	14	11 ¹ / ₄
2 ¹ / ₂	25.00	2 ¹ / ₂	7 ³ / ₄	7	14 ¹ / ₈	13
3	35.00	3	10 ¹ / ₂	7 ¹ / ₂	16 ¹ / ₂	13 ¹ / ₄
4	50.00	4	11	9	17 ¹ / ₂	14
5	80.00	5	12 ³ / ₄	10	18 ¹ / ₂	13 ¹ / ₄
6	110.00	6	15	11	20 ¹ / ₄	14 ¹ / ₂

ANGLE, FLANGED—Fig. No. 238

Size Inches	Price Each	DIMENSIONS						
		A	B	C	D	E	F	G
2 ¹ / ₂	\$25.00	2 ¹ / ₂	8	7	15 ¹ / ₂	11	4 ¹ / ₂	4 ¹ / ₂
3	35.00	3	8 ¹ / ₂	7 ¹ / ₂	16	11 ¹ / ₂	4 ³ / ₄	4 ¹ / ₂
4	50.00	4	10 ¹ / ₂	9	19	13	6	6
5	80.00	5	11 ¹ / ₄	10	21 ¹ / ₄	14 ¹ / ₂	6 ¹ / ₄	6 ³ / ₄
6	110.00	6	13	11	23 ¹ / ₄	15 ¹ / ₄	7 ¹ / ₂	8

List prices include seamless copper float and float rod.

Valves can be furnished screwed at same list prices.

These valves are used to control the make-up water in open tanks, reservoirs, towers, etc., and maintain a constant water line regardless of pressure in supply line. To regulate valve it is only necessary to cut arm to which float is attached to the proper length.

Valves are furnished with flanges faced and drilled.

When ordering, state kind of service, initial water pressure and what variation in water level in tank you require.

Order by Figure Number.

STEAM SPECIALTIES, ETC.

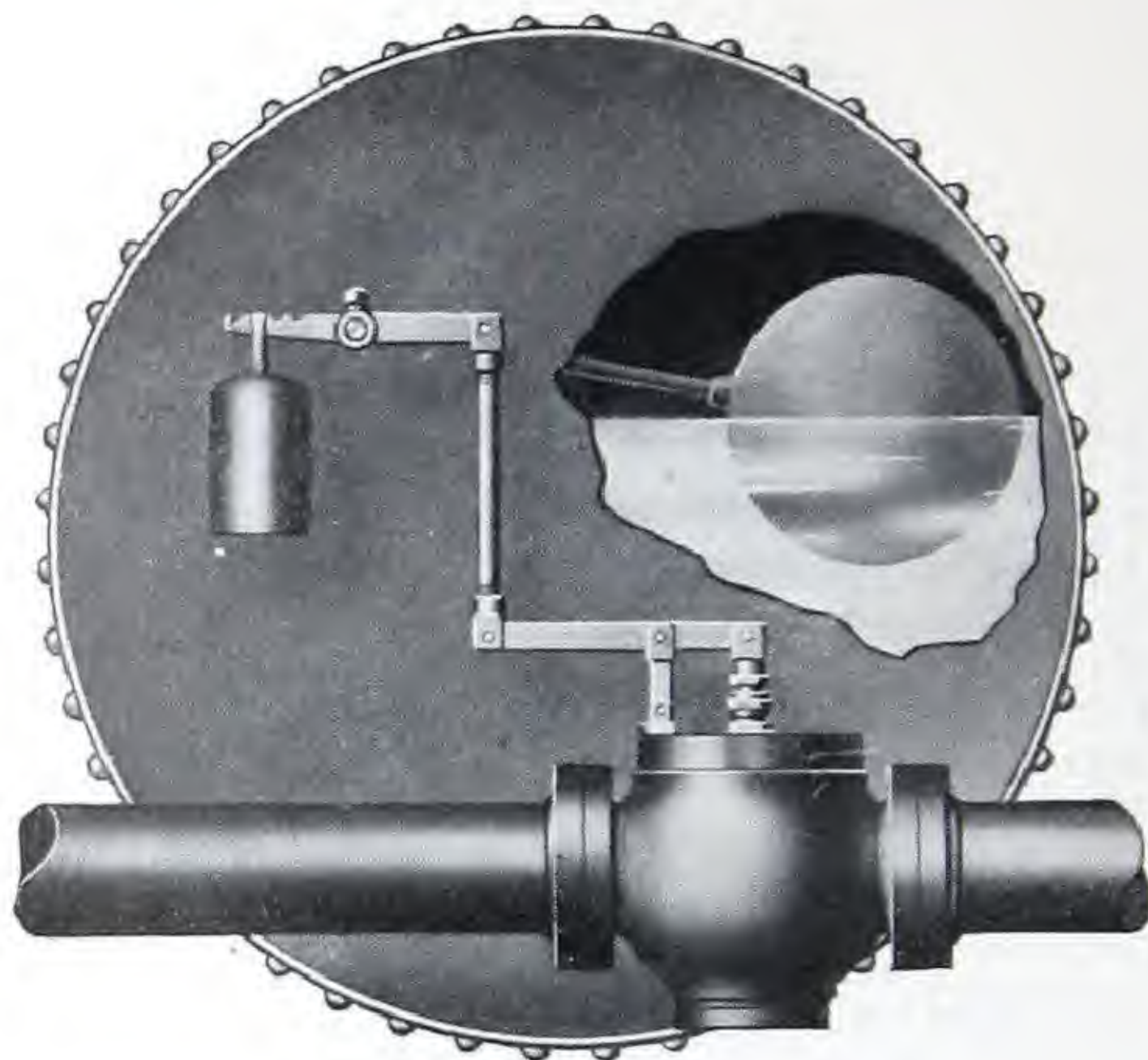
*Atwood & Morrill 20th Century Closed Tank
Water Level Regulators*

Fig. No. 230-E

LIST PRICES

Size.....Inches	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$
Price.....Each	\$50.00	\$60.00	\$70.00	\$80.00
Face to Face.....Inches	$3\frac{1}{2}$	4	$4\frac{1}{2}$	$5\frac{1}{2}$
Size.....Inches	2	$2\frac{1}{2}$	3	4
Price.....Each	\$90.00	\$110.00	\$140.00	\$200.00
Face to Face.....Inches	$6\frac{1}{2}$	$7\frac{7}{8}$	$10\frac{1}{8}$	$10\frac{1}{4}$

As a means of handling condensation returns, drips, etc.

This type of water level controller has been found to give most excellent results in maintaining a constant height of water in the tank to which it is attached by starting and stopping the steam pump, by means of the balance lever valve shown.

It is also used to maintain a water level in the tank when same is used as a reservoir to supply a number of pumps or for any similar purpose.

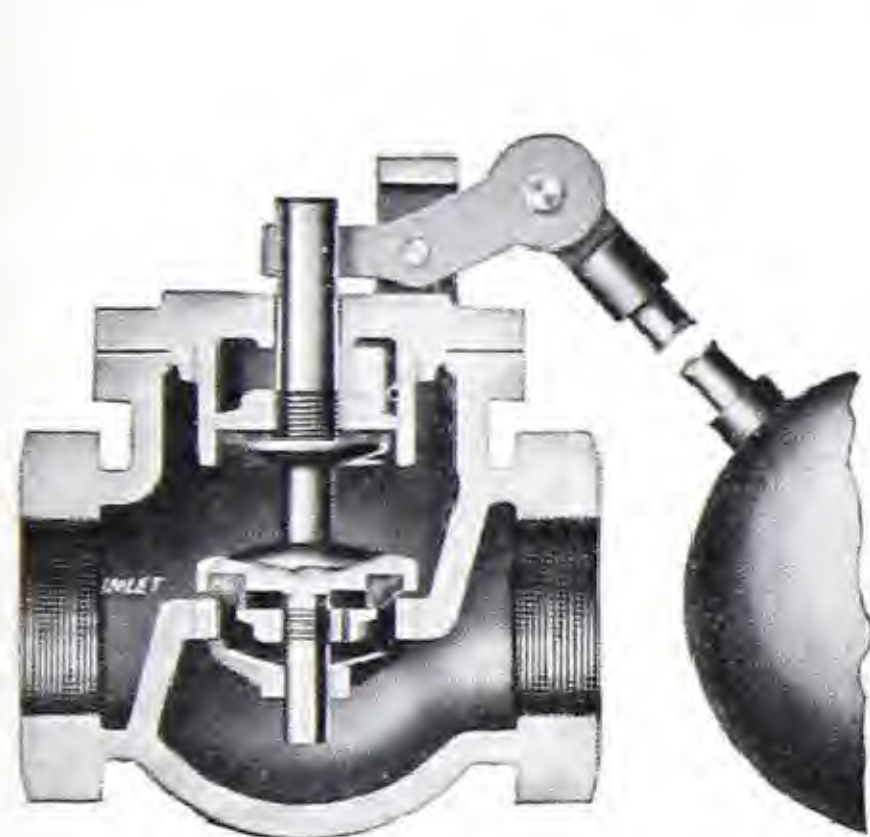
By this improved construction of the regulator it may be easily applied to old or new tanks as it is only necessary to tap the end of the tank with a pipe tap which varies with the size of the valve furnished.

In ordering, the size of the manhole should be stated and the price quoted includes the balance lever valve, float, levers, connections, and the rocker shaft and connection to the tank.

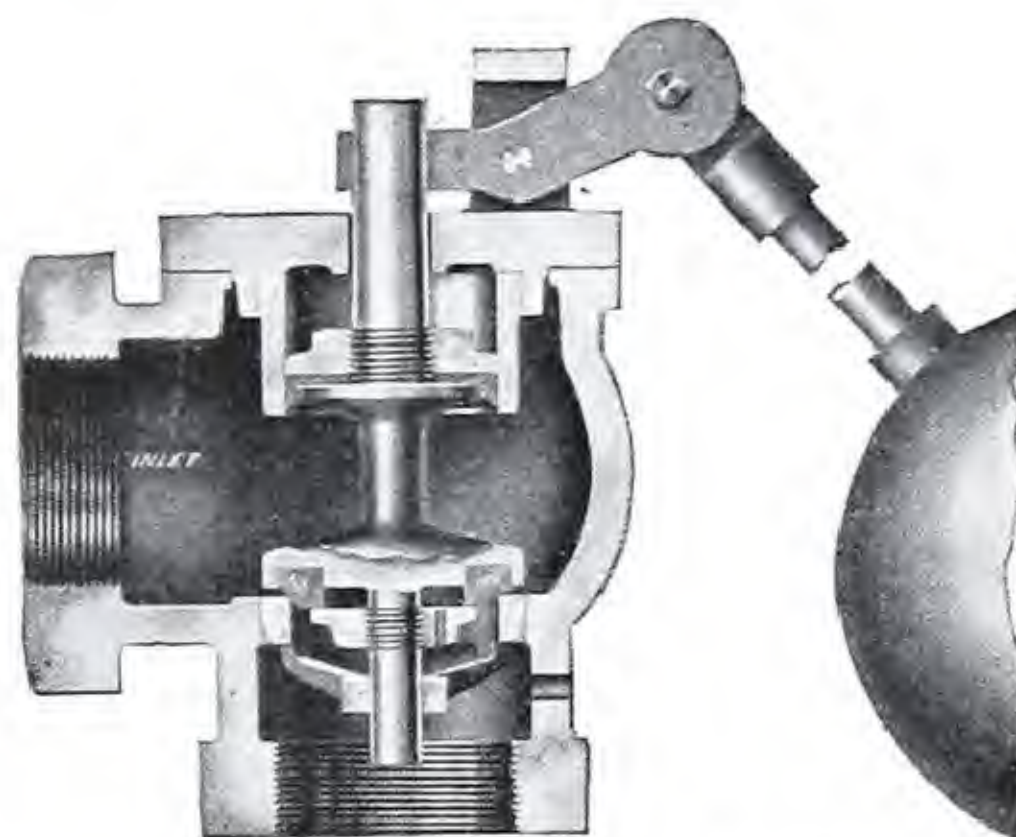
For List Prices on drilling, see page 340.

Order by Figure Number.

STEAM SPECIALTIES, ETC.

Atwood & Morrill 20th Century
Tank Valves*For Pressures up to 150 Lbs.*

Globe—Fig. No. 231-E



Angle—Fig. No. 232-E

LIST PRICES—Fig. No. 231-E

Size.....Inches	1	1¼	1½	2	2½	3	4	5	6
Price.....Each	10.00	14.00	15.00	20.00	25.00	35.00	50.00	80.00	110.00
End to End.....Inches	4	4½	5½	6½	7⅞	10⅞	10¾	11¼	15
Size Float.....Inches	6	6	6	6	8	8	10	12	12

LIST PRICES—Fig. No. 232-E

Size.....Inches	1	1¼	1½	2	2½	3	4	5	6
Price.....Each	10.00	14.00	15.00	20.00	25.00	35.00	50.00	80.00	110.00
Center to Ends.....Inches	2¼	2½	3	3½	4⅜	4½	5½	6⅜	7¼
Sizes Float.....Inches	6	6	6	6	8	8	10	12	12

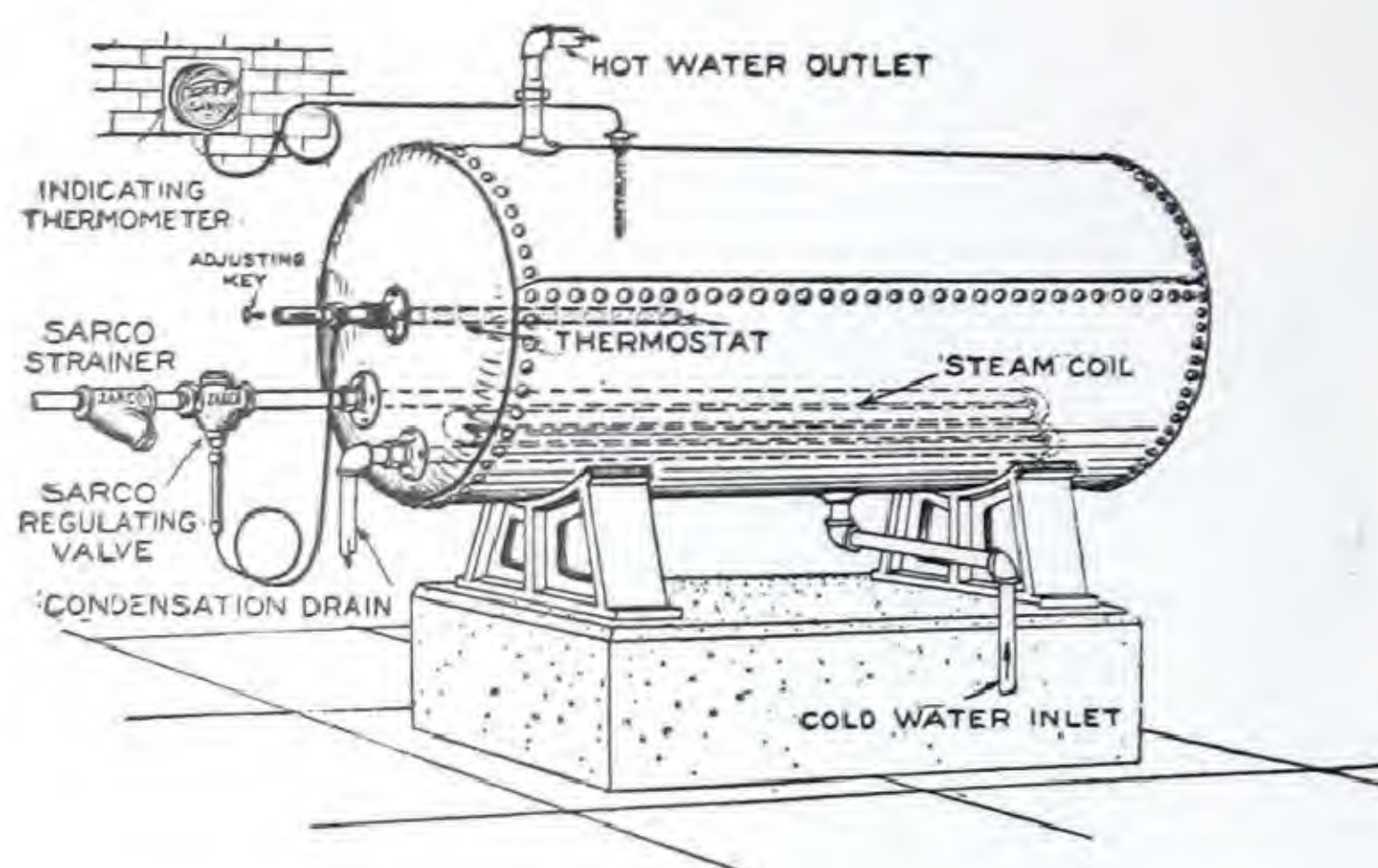
Made in sizes 1 to 6 inches, with screw ends only.

These valves are especially designed so as to be accessible for repairs. A specially designed soft valve seat is used, and a leather cup packing in the balancing piston. Seat ring and balancing cylinder are of bronze. A swivel attachment is furnished on the end of the lever by which the float may be elevated or depressed as desired. Seamless copper floats of good quality are furnished with these valves, and are fully guaranteed.

For sizes over 6 inches a different type of valve is furnished, Fig. No. 233-E, Globe or Angle, Flanged. Prices on application.

Order by Figure Number.

STEAM SPECIALTIES, ETC.

*Sarco Temperature Regulators**For Controlling Temperature of Liquids*

Showing Application of Regulator
to Hot Water Service Tank



Type TR. 21
For Tank Control
Fig. No. 1604

LIST PRICES

Size.....Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Price Screwed.....Each	75.00	80.00	85.00	90.00	95.00	100.00
Bulb Thread I.P.S.....Inches	$1\frac{1}{4}$	$1\frac{1}{4}$	$1\frac{1}{4}$	$1\frac{1}{4}$	$1\frac{1}{4}$	$1\frac{1}{4}$
Bulb Length.....Inches	$20\frac{3}{4}$	$20\frac{3}{4}$	$20\frac{3}{4}$	$20\frac{3}{4}$	$20\frac{3}{4}$	$20\frac{3}{4}$
End to End, Screwed.....Inches	$2\frac{3}{4}$	$3\frac{3}{8}$	$3\frac{11}{16}$	$4\frac{1}{2}$	5	6
Size.....Inches	$2\frac{1}{2}$	3	4	5	6	.....
Price Screwed.....Each	115.00	130.00	.....	.....	.....	.....
Price, Flanged.....Each	.....	.....	170.00	225.00	275.00	.....
Bulb Thread I.P.S.....Inches	$1\frac{1}{4}$	$1\frac{1}{4}$	$1\frac{1}{4}$	$1\frac{1}{4}$	$1\frac{1}{4}$	.....
Bulb Length.....Inches	$20\frac{3}{4}$	$20\frac{3}{4}$	$20\frac{3}{4}$	$20\frac{3}{4}$	$20\frac{3}{4}$	.....
End to End, Screwed.....Inches	$7\frac{1}{4}$	$8\frac{3}{4}$	.....	.....	.....	.....
Face to Face, Flanged.....Inches	.....	.....	$13\frac{3}{4}$	$15\frac{3}{4}$	18	.....

Sizes $\frac{1}{2}$ to 3-inch are made with Screwed Ends only.

Sizes 4, 5 and 6-inch are Iron Body, Flanged. Flanges drilled American Standard.

The above prices include 6 feet tubing between control valve and thermostat. Longer lengths subject to charge of 50 cents per additional foot of armored tubing. If lead sheathing of thermostat is necessary, there is an additional charge of \$3.50 net.

Type TR. 21 for tank control can be used for any specified temperature range from 30° F to 300° F and can be used not only in tanks but also for dry kilns. Temperature regulators can be furnished for any particular service. An inquiry or order should specify type of service and temperature range and whether thermostat is exposed to corrosive gas or liquid. We will be glad to recommend the proper type.

Order by Figure Number.

STEAM SPECIALTIES, ETC.
Sheldon Cast Iron Exhaust Heads

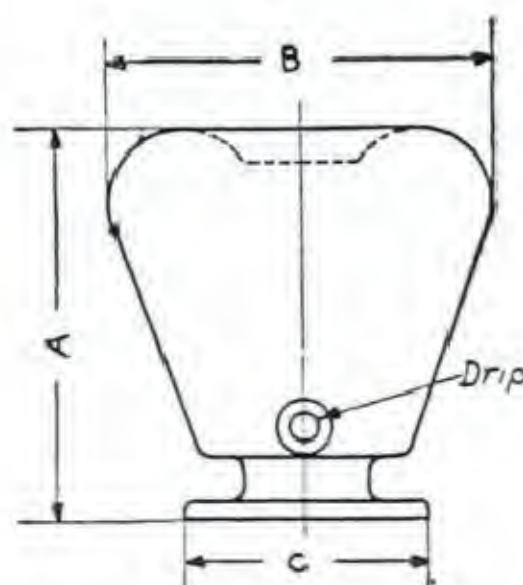


Fig. No. 12

LIST PRICES AND DIMENSIONS

Size of Exhaust Pipe Inches	Price Each	Diam. Flanges C	Largest Diam. B	Greatest Height A	Size of Drip	Weight in Lbs.
2	\$25.00	6	8 $\frac{1}{4}$	8	$\frac{3}{4}$	40
2 $\frac{1}{2}$	25.00	7	11 $\frac{3}{8}$	11 $\frac{1}{2}$	1	50
3	30.00	7 $\frac{1}{2}$	12 $\frac{1}{2}$	12 $\frac{7}{8}$	1	50
3 $\frac{1}{2}$	35.00	8 $\frac{1}{2}$	13 $\frac{1}{4}$	14	1	85
4	40.00	9	13 $\frac{7}{8}$	14 $\frac{3}{4}$	1	85
4 $\frac{1}{2}$	45.00	9 $\frac{1}{4}$	13 $\frac{7}{8}$	14 $\frac{3}{4}$	1	135
5	50.00	10	17 $\frac{1}{8}$	18 $\frac{5}{8}$	1	135
6	60.00	11	20 $\frac{5}{16}$	18	1 $\frac{1}{4}$	165
7	75.00	12 $\frac{1}{2}$	23 $\frac{5}{8}$	19	1 $\frac{1}{4}$	235
8	90.00	13 $\frac{1}{2}$	27 $\frac{1}{4}$	21 $\frac{1}{8}$	1 $\frac{1}{2}$	300
10	125.00	16	29 $\frac{1}{2}$	24	2	350
12	150.00	19	34	27 $\frac{3}{8}$	2	500
14	200.00	21	38 $\frac{1}{4}$	29	2 $\frac{1}{2}$	770
16	250.00	23 $\frac{1}{2}$	42 $\frac{1}{4}$	30 $\frac{1}{8}$	3	1040
18	300.00	25	48	32	3	1275
20	360.00	.....	.....	.....	.....	1600
22	450.00	.....	.....	.....	.....	2000
24	600.00	.....	.....	.....	.....	2500
30	900.00	.....	.....	.....	.....	4800
36	1,200.00	.....	.....	.....	.....	6800

This exhaust head is of cast iron throughout. The 2 inch size is furnished with either screwed or flanged connections. All other sizes are flanged, and all sizes from 2 $\frac{1}{2}$ inch to 16 inch inclusive are furnished with companion flanges, without extra charge.

Sizes smaller than 2 inch, price furnished on application.

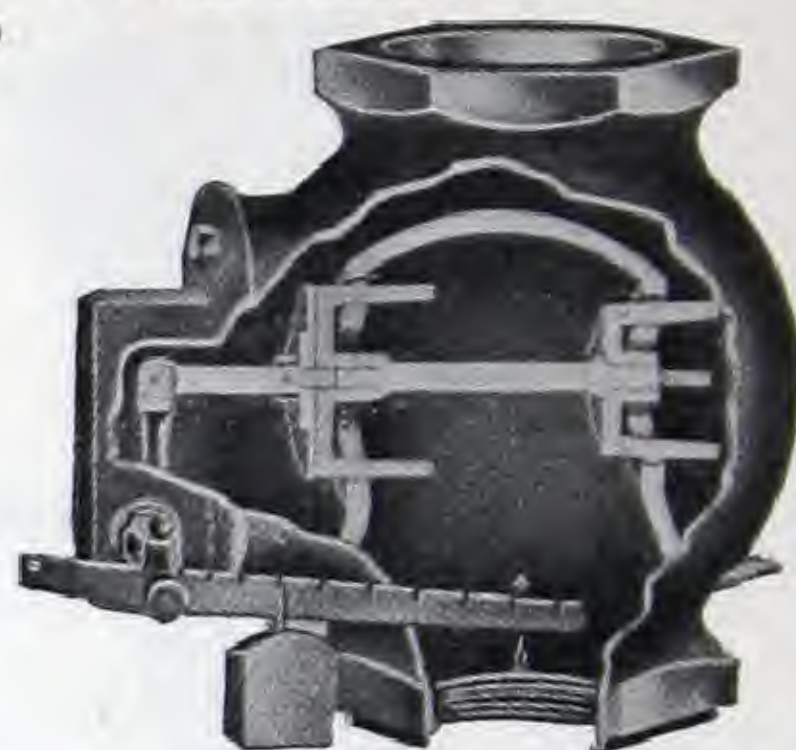
Order by Figure Number.

STEAM SPECIALTIES, ETC.
Sheldons Iron Body Back Pressure Valves
Double-Seated Piston Type—Bronze Mounted

"Class A"



Flanged—Fig. No. 20
 Showing horizontal application



Screwed—Fig. No. 17
 Sectional View
 Showing vertical application

LIST PRICES AND DIMENSIONS

Size Inches	Price Each	Diameter of Flanges	Face to Face Flanged	Approx. Weight
2	\$14.00	6	7	25
2½	16.00	7	7½	30
3	18.00	7½	9	50
3½	22.00	8½	10	60
4	25.00	9	10½	75
†4½	30.00	9¼	12	90
5	40.00	10	13	110
6	60.00	11	15	160
†7	80.00	12½	16	200
8	100.00	13½	17	240
†9	120.00	15	19	350
10	145.00	16	20	395
12	220.00	19	23	525
14	345.00	21	25	750
16	465.00	23½	32	1000
18	600.00	25	35	1500
20	750.00	27½	35	2000
†22	900.00	.....	.....	2500
24	1050.00	.....	.....	3000

†Standard practice of manufacturers urges the discontinuance of these sizes which are considered as special.

Sizes 2-inch to 12-inch furnished either Screwed or Flanged.

Sizes 14-inch and larger furnished Flanged only.

"Class A" Back Pressure Valves are designed for use in connection with non-condensing engines, vacuum or direct systems of steam heating. NOT to be used with condensing engines.

For List Prices on drilling, see page 340.

Order by Figure Number.

STEAM SPECIALTIES, ETC.

*Sheldon Steam and Oil Separators**For Pressures up to 125 Lbs.*Horizontal Separator
Fig. No. 27Vertical Separator
Fig. No. 28

LIST PRICES AND DIMENSIONS

Size Inches	Price Each	Diameter of Flanges	Face to Face	
			Fig. No. 27	Fig. No. 28
1½	\$18.00	6	11 1/16	14
2	24.00	6	11 1/16	14
2½	27.00	7	13 1/16	15
3	30.00	7½	14 7/8	15½
3½	36.00	8½	17	17 3/8
4	42.00	9	16 1/4	18 5/8
†4½	45.00	9¼	18 7/8	20 5/8
5	48.00	10	18 3/8	22½
6	66.00	11	21	26
†7	75.00	12½	24 1/4	28½
8	96.00	13½	27 1/4	31 5/16
10	132.00	16	31 3/4	37 7/8
12	150.00	.....	.....	.....

†Standard practice of Manufacturers urges the discontinuance of these sizes which are considered as specials.

Furnished with Gauge Glass and Drip Valve.

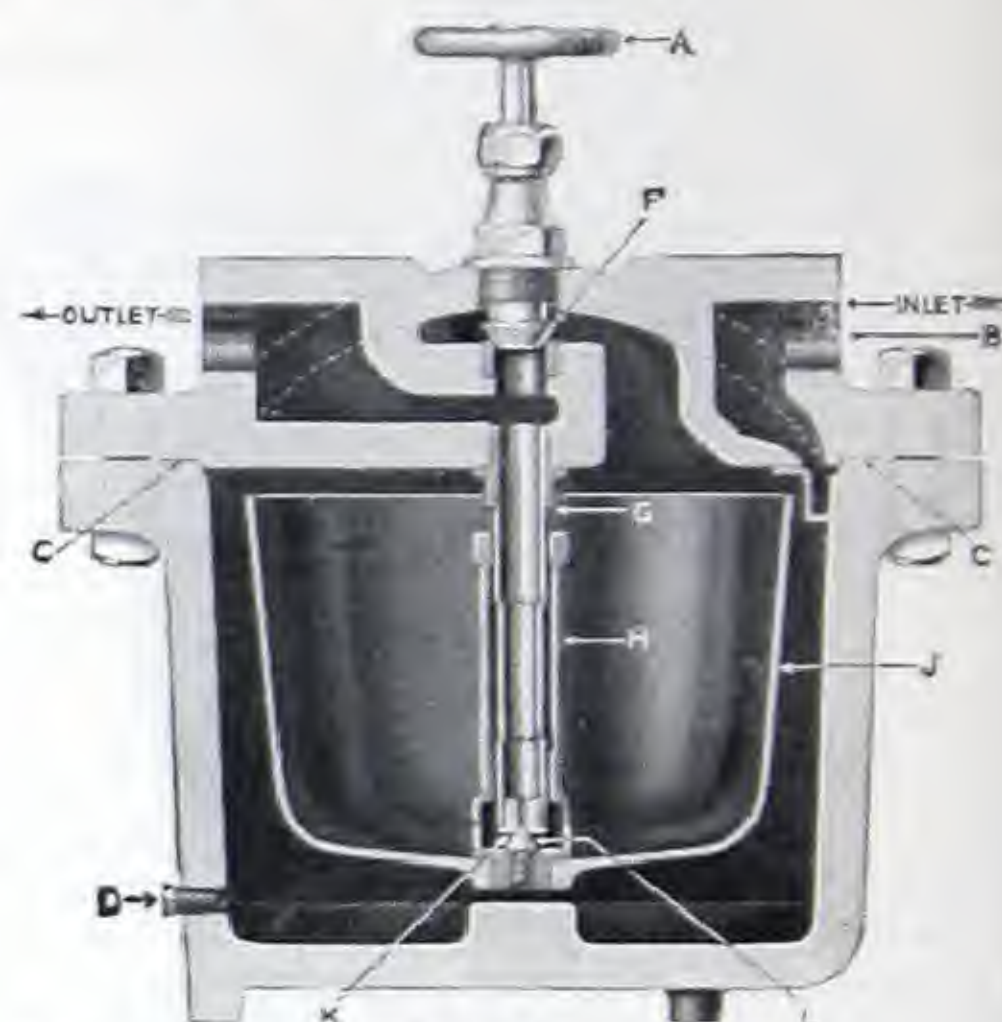
Sizes up to and including 2 inch are furnished with screwed or flanged ends. All larger sizes are furnished with flanged ends and companion flanges.

Order by Figure Number.

STEAM SPECIALTIES, ETC.

Grinnell Steam Traps

For Steam Pressures up to 200 Lbs.



Light Pattern—For Pressures from 0 to 25 Lbs.—Fig. No. 1403

Standard Pattern—For Pressures from 25 to 125 Lbs.—Fig. No. 1404

Extra Heavy Pattern—For Pressures from 100 to 200 Lbs.—Fig. No. 1405

LIGHT PATTERN—Fig. No. 1403

Size Number	Price Each	Pipe Size Inlet and Outlet Inches	TRAP WILL DRAIN		
			Steam Pressure at Trap Pounds	Square Feet of Direct Radiation	Linear Feet of 1-inch Pipe
1	\$16.00	$\frac{1}{2}$	5	400	1,200
2	20.00	$\frac{3}{4}$	5	700	2,100
3	27.50	1	5	1,200	3,600
4	42.50	$1\frac{1}{4}$	15	2,200	6,600
5	70.00	$1\frac{1}{2}$	15	6,000	18,000

STANDARD PATTERN—Fig. No. 1404

Size Number	Price Each	Pipe Size Inlet and Outlet Inches	TRAP WILL DRAIN		
			Steam Pressure at Trap Pounds	Square Feet of Direct Radiation	Linear Feet of 1-inch Pipe
1	\$16.00	$\frac{1}{2}$	25	400	1,200
2	20.00	$\frac{3}{4}$	25	700	2,100
3	27.50	1	25	1,200	3,600
4	42.50	$1\frac{1}{4}$	25	1,850	5,550
5	70.00	$1\frac{1}{2}$	25	6,000	18,000

When ordering always specify steam pressure under which trap will operate.

Order by Figure Number.

STEAM SPECIALTIES, ETC.

*Grinnell Steam Traps**For Steam Pressures up to 200 Lbs.**(Continued)*

EXTRA HEAVY PATTERN—Fig. No. 1405

Size Number	Price Each	Pipe Size Inlet and Outlet Inches	TRAP WILL DRAIN		
			Steam Pressure at Trap Pounds	Square Feet of Direct Radiation	Lineal Feet of 1-inch Pipe
1	\$16.85	$\frac{1}{2}$	150	400	1,200
2	21.30	$\frac{3}{4}$	150	500	1,500
3	29.25	1	150	1,500	4,500
4	45.50	$1\frac{1}{4}$	150	2,400	7,200
5	74.75	$1\frac{1}{2}$	150	4,000	12,000

LIST PRICES ON PARTS—Fig. Nos. 1403, 1404, 1405

Size Number	By-Pass Valve A With Disc F Each	Spindle G, Seat K, Guide H and Disc L Per Set	Monel Seat K and Disc L Per Set	Float J Each
1	\$2.00	\$ 7.00	\$3.00	\$1.00
2	2.25	8.00	3.50	1.25
3	2.50	10.00	4.50	1.75
4	3.50	14.00	5.25	3.00
5	4.00	15.00	5.75	3.50

The Grinnell Steam Trap was designed to furnish, at a moderate price, a trap of simple construction that will keep pipe clear of water and continue in good working order with very little attention.

The Light Pattern is used for steam pressures, 0 to 25 lbs.; the Standard Pattern is used for steam pressures, 25 to 125 lbs.; the Extra Heavy Pattern is used for steam pressures, 100 to 200 lbs.

The Body and Cover are cast iron. Working parts are bronze except cast iron Float J and monel Seat K and Disc L. Replacement working parts may be secured which are interchangeable with parts furnished with the Trap.

Directions:

Set the trap level on solid foundation or bracket.

To quickly free the piping of water, when starting trap, open the by-pass valve A, then close this valve and the trap will continue to drain the pipe of water automatically.

We recommend installing one of our Sediment Strainers in the inlet pipe B, close to trap to prevent damage to the internal parts of the trap, from foreign matter coming through the pipe. Also that traps be installed with by-pass around trap.

To Order:

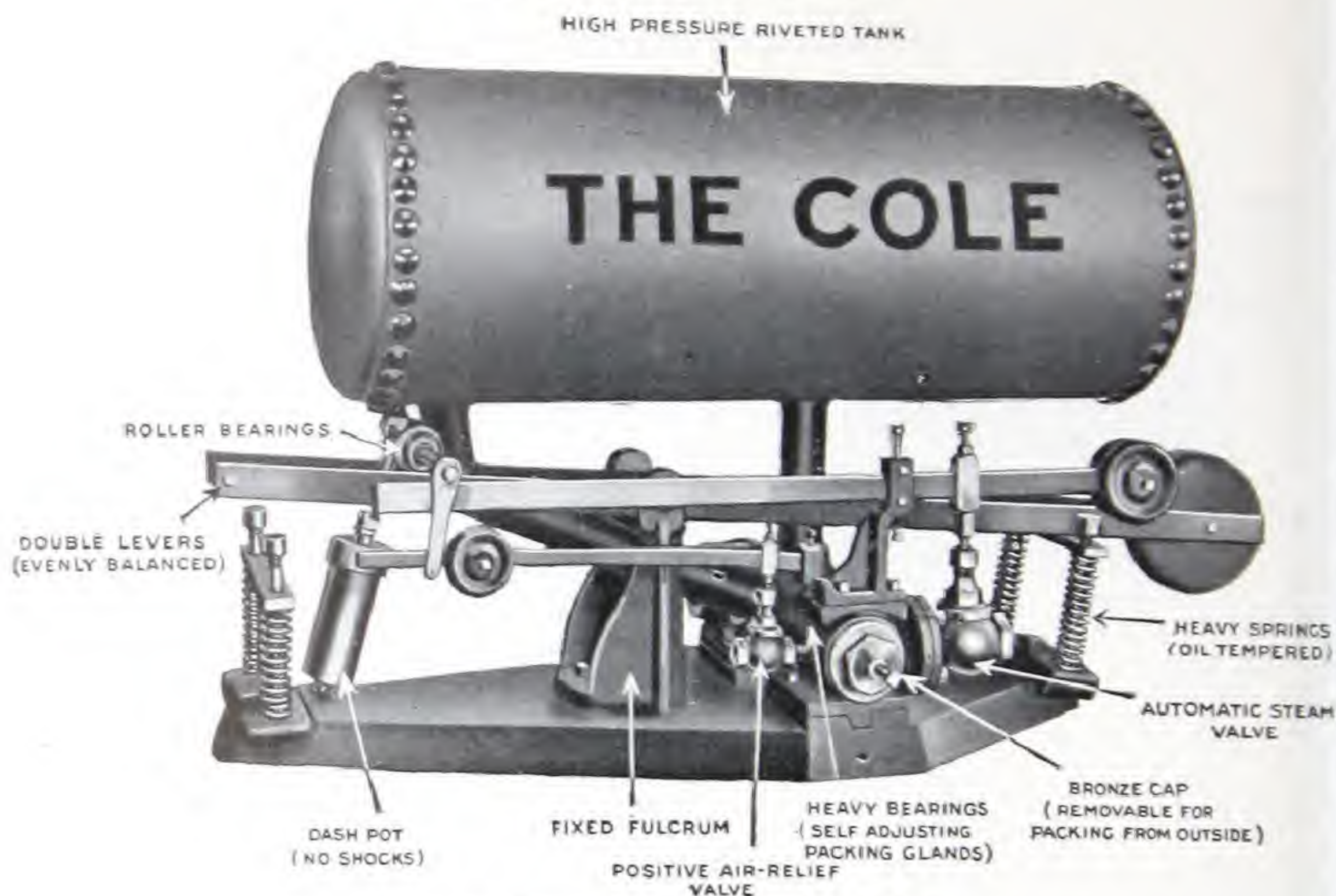
When ordering Steam Traps always specify steam pressure under which it will operate. Always order a Trap large enough for the requirements.

When ordering Replacement Parts, always specify name and letter of parts; size of trap and pattern or Figure Number; steam pressure under which it will operate.

This will facilitate shipment and prevent error.

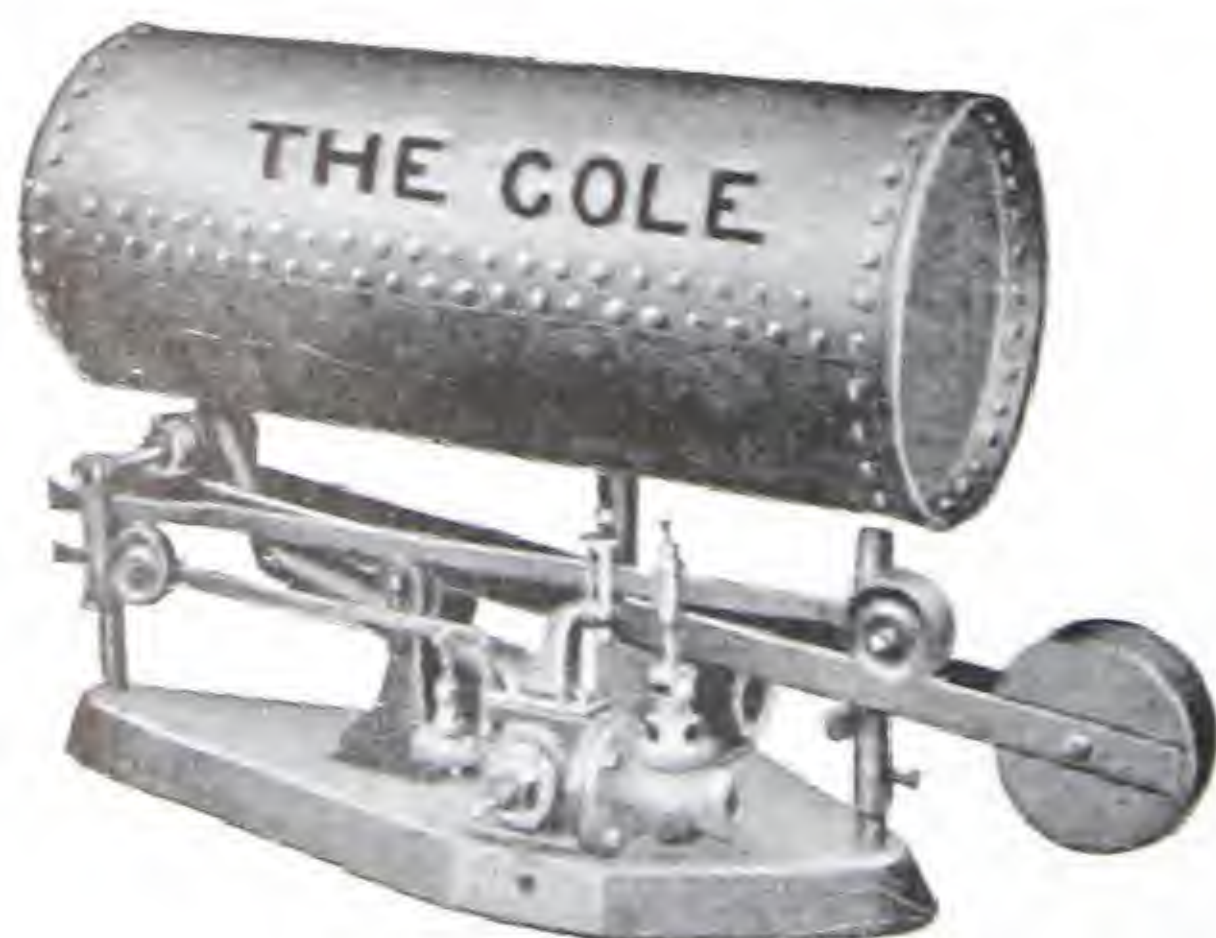
Order by Figure Number.

STEAM SPECIALTIES, ETC.

*"Cole" Tilting Steam Traps**For Pressures up to 125 Lbs.*

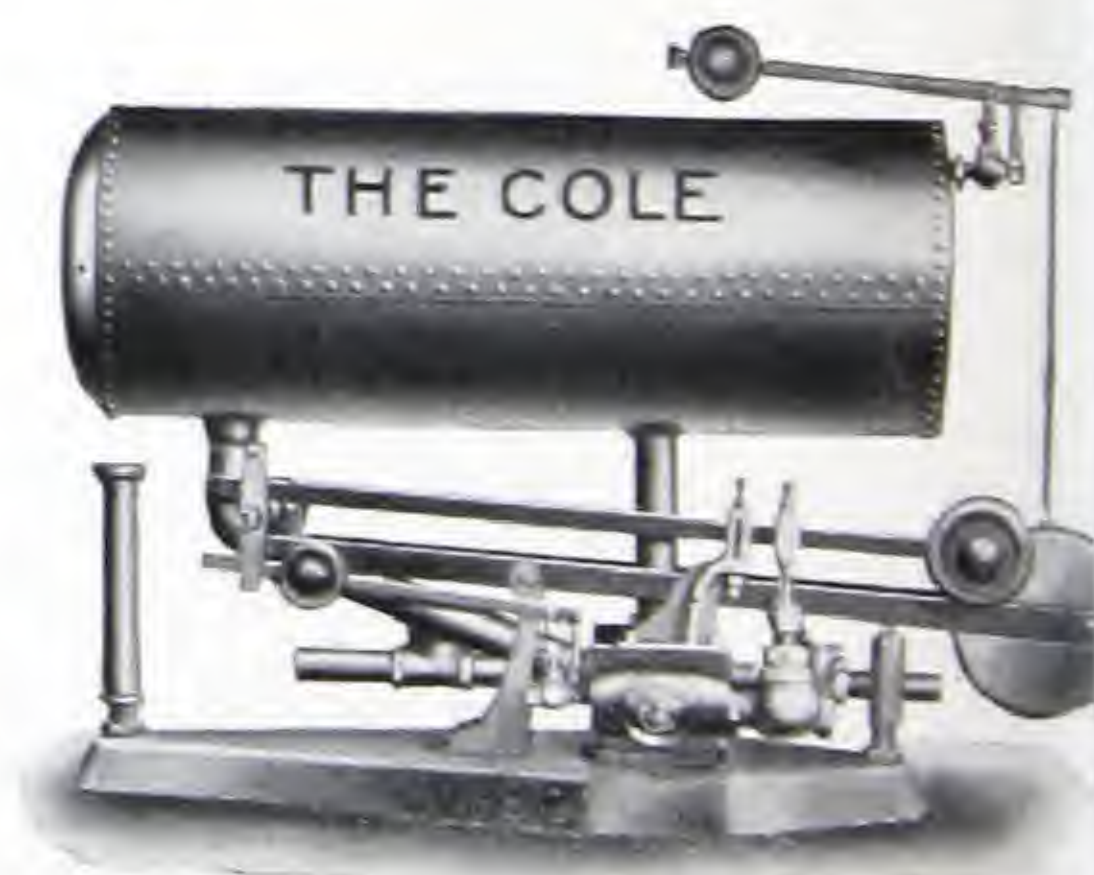
Cole Return Trap—Fig. No. 1611

Trap Nos. 5, 6, 7 and 8



Cole Return Trap—Fig. No. 1611

Trap Nos. 1, 2, 3 and 4

Cole Condenser Trap
Fig. No. 1613

STEAM SPECIALTIES, ETC.

"Cole" Tilting Steam Traps—(Continued)*For Pressures up to 125 Lbs.***"COLE" DIRECT RETURN TRAP AND BOILER FEEDER**

Fig. No. 1611

These machines are of the same construction as a Boiler Feed Trap. The condensate is delivered into Tank of Trap. The Tank automatically tilts when sufficiently full, opening live steam valve. The live steam then enters tank of Trap, equalizing the pressure to the same that is in Boiler. The Trap being at least 3 feet above water line, the condensate flows into the boiler by gravity. (See Table No. 1).

"COLE" LIFTING TRAP—Fig. No. 1612

The "Cole" Lifting Trap is used to lift Condensate to Boiler Feed Trap or higher levels. Same construction as Return Trap. See Table No. 1.

"COLE" CONDENSER TRAP—Fig. No. 1613

In general construction the same as the Return Trap. In detail it differs, in the addition of a cold water connection through flexible hose, and Automatic Valve. This hose is connected to a perforated pipe running full length of Tank at top, acting on same principles as Jet Condenser. See Table No. 1.

"COLE" NON-RETURN OR TANK TRAP—Fig. No. 1614

Is used where Condensation is to be discharged into Tank, hot well, etc., but not into Boilers. It must always be below apparatus drained. See Table No. 2.

"COLE" VACUUM TRAP—Fig. No. 1615

After the principle of Non-Return-Trap. Used to remove condensate under Vacuum without destroying Vacuum. Can also be used as Metering Trap. See Table No. 2.

"COLE" THREE VALVE TRAP—Fig. No. 1616

Combining the Lifting, Non-Return and Vacuum Features. Used on Return lines where pressures vary from Vacuum to high Pressure. Used on Kettles, Vacuum Pans, Evaporators, etc. See Table No. 1.

Instructions in full detail accompany each machine.

LIST PRICES

Trap Number	Return Fig. No. 1611	Lifting Fig. No. 1612	Condenser Fig. No. 1613	Non- Return Fig. No. 1614	Vacuum Fig. No. 1615	Three- Valve Fig. No. 1616
1	\$132.00	\$132.00	.....	\$132.00	\$132.00	.....
2	160.00	160.00	\$175.00	160.00	160.00	\$176.00
3	180.00	180.00	195.00	180.00	180.00	198.00
4	260.00	260.00	275.00	260.00	260.00	286.00
5	380.00	380.00	395.00	380.00	380.00	418.00
6	480.00	480.00	495.00	480.00	480.00	528.00
7	560.00	560.00	575.00	560.00	560.00	616.00
8	1000.00	1000.00	1015.00	1000.00	1000.00	1100.00

Tables of Capacities on following page.
Order by Figure and Trap Numbers.

STEAM SPECIALTIES, ETC.

"Cole" Tilting Steam Traps—(Continued)

TABLE No. 1

Table of Capacities of "Cole" Tilting Steam Traps—Return, Tilting, Condenser, and Three Valve types. NOTE:—These capacities are based on sixty operations per hour with a pressure equal to ten pounds per square inch at inlet. Horse power based on thirty pounds of water per hour. For Lumber Kilns and Greenhouses divide capacity by two. For Laundries and Brick Dryers divide by three. For Fan Stacks where air is drawn from outside, divide by five.

Trap Number	Size of Tank in Inches	Size of Steam Valve	Size of Inlet and Discharge	Pounds of Water per Hour	Direct Radiation in Sq. Ft.	Lin. Ft. 1" Pipe	Boiler Horse Power	App. Shipping Weight	Height Over All Inches
1	6 x 18	$\frac{3}{8}$	$\frac{1}{2}$	540	1620	4860	18	100	19
2	9 x 22	$\frac{1}{2}$	$\frac{3}{4}$	1400	4320	13960	48	175	23
3	10 x 24	$\frac{3}{4}$	1	2400	7200	21600	80	200	24
4	12 x 30	1	$1\frac{1}{4}$	4320	12960	38880	144	275	29
5	14 x 36	1	$1\frac{1}{2}$	6720	20160	60480	224	350	34
6	16 x 40	$1\frac{1}{4}$	2	10200	30600	91800	340	400	36
7	18 x 48	$1\frac{1}{2}$	$2\frac{1}{2}$	18000	54000	162000	600	600	41
8	20 x 48	$2\frac{1}{2}$	3	24000	72000	216000	800	750	44

TABLE No. 2

Capacities of "Cole" Tilting Steam Traps—"Non-Return Type" in pounds of water per hour at various pressures.

Pressure at Trap Pounds	Trap Numbers							
	1	2	3	4	5	6	7	8
5	900	1800	3000	4320	6720	9350	13500	16000
10	1305	2800	4800	6480	10080	13600	18000	24000
20	1800	3840	6400	9360	12880	18700	24000	30000
25	2070	4200	7000	10800	14000	21250	28500	36000
30	2250	4560	7680	11880	15120	23800	30600	38000
40	2610	5400	9200	13460	17920	27200	36000	44000
50	2925	6200	10000	15000	20000	30170	39900	50400
60	3150	6800	10960	16470	22100	33170	43900	55400
75	3375	7360	12540	18500	24000	38000	49300	61400

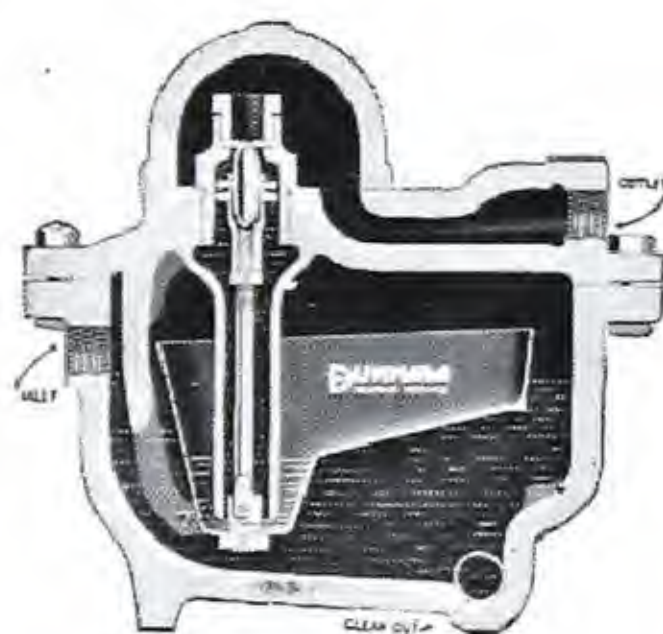


"Cole" Receivers—Fig. No. 1617

Size Number	List Price	Size Inches	Capacity in Lbs. of Water
1	\$ 44.00	6 x 18	20
2	52.00	9 x 22	45
3	60.00	10 x 24	60
4	80.00	12 x 30	110
5	96.00	14 x 36	200
6	128.00	16 x 40	275
7	152.00	18 x 48	500

All Standard Traps and Receivers built for working pressure up to 125 lbs. Order by Figure and Size Numbers.

STEAM SPECIALTIES, ETC.

*Dunham Bucket Traps**For Steam or Compressed Air Service**For Pressures up to 150 Lbs.*

Dunham Bucket Trap
Fig. No. 80

LIST PRICES AND CAPACITIES

Size Inches	Price Each	Capacity Lineal Feet of 1 Inch Pipe	Capacity Square Feet of Radiation	Capacity Pounds of Water per Hour	Approx. Weight
$\frac{1}{2}$	\$25.00	9,000	3,000	1,000	55
$\frac{3}{4}$	30.00	13,000	4,500	1,500	90
1	40.00	18,000	6,000	2,000	130
$1\frac{1}{4}$	55.00	40,500	13,500	4,500	150

Valve and Seat are Monel Metal and are reversible.

Schedule of pressures for Valves and Seats:—

For 30 to 50 lbs. pressure—Style "A" Valve and Seat.

For 50 to 125 lbs. pressure—Style "B" Valve and Seat.

For 125 to 150 lbs. pressure—Style "C" Valve and Seat.

Unless otherwise specified these traps are furnished with Valves and Seats for 125 lbs. pressure.

Order by Figure Number.

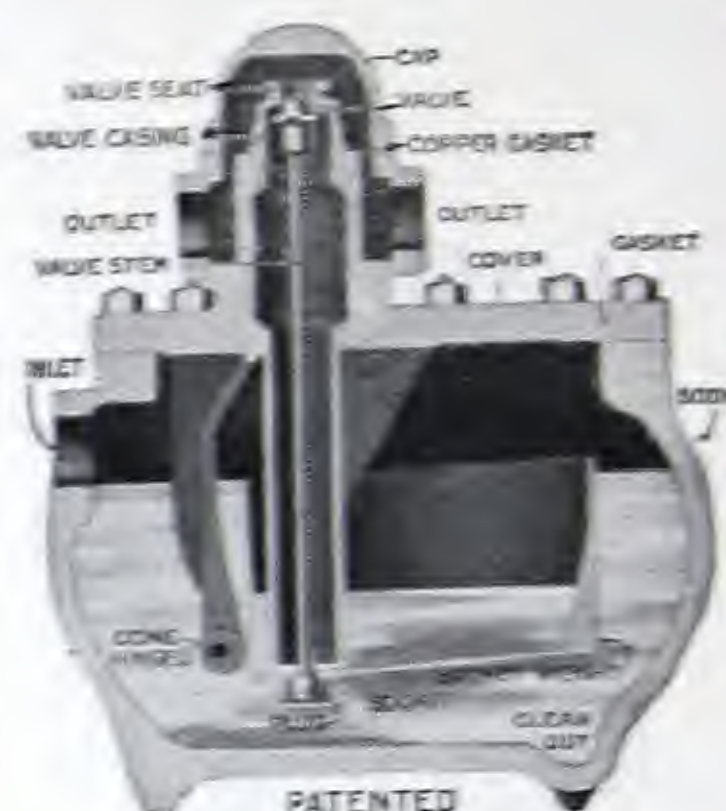
STEAM SPECIALTIES, ETC.

Genuine Squires Steam Traps

For High and Low Pressure
Steam, Air and Gas



Fig. No. 1598



STANDARD VALVE MECHANISM—Fig. No. 1598

Size Trap	Pipe Connection	CAPACITY			List Price Each
		Linear Ft. of 1" Pipe	Sq. Ft. of Radiation	Pounds Water Per Hour	
$\frac{3}{8}$ "	$\frac{3}{8}$ "	3000	1040	400	\$14.00
A	$\frac{1}{2}$ "	4350	1505	800	20.00
B	$\frac{3}{4}$ "	6300	2180	1300	22.00
C	1"	9300	3220	2100	28.00
D	1 $\frac{1}{4}$ "	16500	5710	2900	35.00
E	1 $\frac{1}{2}$ "	28200	9755	4200	50.00
F	2"	40800	14115	6500	70.00
G	2 $\frac{1}{2}$ "	98100	33945	12500	100.00
H	3, 3 $\frac{1}{2}$, 4"	271750	94025	28000	200.00

DOUBLE VALVE MECHANISM (Not Ill.)—Fig. No. 1599

Size Trap.....	A	B	C	D	E	F	G
Pipe Connection.....	$\frac{1}{2}$	$\frac{3}{4}$	1	1 $\frac{1}{4}$	1 $\frac{1}{2}$	2	2 $\frac{1}{2}$
Cap. lbs. per hour.....	1200	1800	2800	3800	5600	10000	18000
Price..... Each	\$24.00	\$27.00	\$34.00	\$42.00	\$60.00	\$84.00	\$120.00

The Double Valve Mechanism Trap is not recommended for pressures under 100 pounds.
The Standard and Double Mechanism Traps can be furnished in steel at special prices.
Vacuum attachments can be supplied for these traps at an additional list price of \$2.00 each.

State pressure when ordering traps.

Order by Figure Number.

STEAM SPECIALTIES, ETC.

*Armstrong Steam Trap**For Pressures up to 300 Lbs.*Armstrong Standard Steam Trap
Fig. No. 1600

LIST PRICES

Trap Number	Pipe Conn.	Pounds Pressure	Pounds per Hour	Gallons per Hour	Square Feet Radiation	Lineal Feet 1-inch Pipe	Price Each
2 and 2 Special	* $\frac{3}{4}$ "	15	2753	332	2503	7509	No. 2 \$20.75 No. 2 Special \$27.75
		30	3074	370	2459	7377	
		60	2534	305	1564	4692	
	or $\frac{1}{2}$ "	120	1195	144	515	1545	
		160	1245	150	488	1464	
		240	811	98	275	725	
		300	614	74	180	640	
3 and 3 Special	* $1\frac{1}{4}$ "	15	11013	1327	10012	30036	No. 3 \$38.00 No. 3 Special \$45.00
		30	12297	1481	9838	29514	
		60	7352	886	4538	13614	
	or 1"	110	5400	651	2432	7296	
		180	3972	479	1499	4497	
		250	3297	397	1099	3297	
		300	2579	311	759	2277	
4 and 4 Special	*2"	15	28216	3399	25651	76953	No. 4 \$70.00 No. 4 Special \$90.00
		40	24554	2958	17923	53769	
	or $1\frac{1}{2}$ "	100	16455	1983	7762	23286	
		200	8827	1063	3210	9630	
		300	6371	767	1874	5622	

*This size pipe connection furnished, unless otherwise specified.

Special types are for use on pulsating pressures.

The Armstrong Steam Trap operates through the rise and fall of an inverted submerged bucket, the motion of this bucket being imparted to the valve through a compound leverage. Referring to the illustration it will be noted the bucket hangs with its open end down, directly over the inlet which is centrally located in the bottom of the trap. As the outlet of the trap is at the top, the body must be full of water before any flows out. The trap is shown with the bucket in its lowest position with the valve open. Water entering the trap flows into the open end of the bucket, then out around the bottom, up and through the valve. This flow will continue so long as water enters the trap.

Order by Figure and Trap Numbers. State maximum operating pressure.

STEAM SPECIALTIES, ETC.

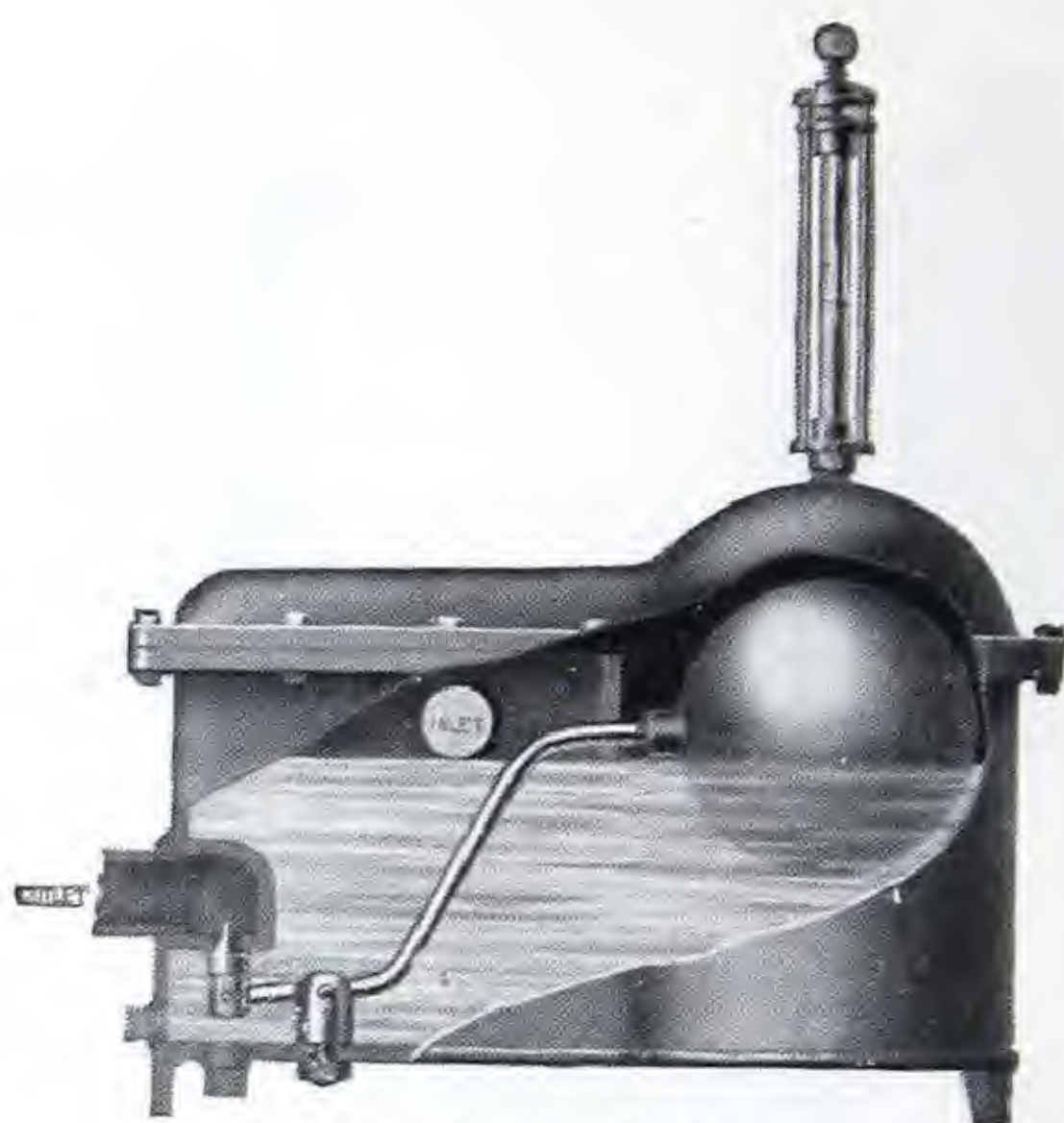
*Empire Steam Traps**Low Pressure*

Fig. No. A661

LIST PRICES AND CAPACITIES

Size Number.....	00	0	1
Size pipe conn's inlet.....	$\frac{3}{4}$ "	1	$1\frac{1}{4}$
Size pipe conn's outlet.....	$\frac{3}{4}$ "	$\frac{3}{4}$	1
Pound water per hour.....	1000	1700	4000
Sq. ft. of radiation.....	3000	5000	12000
Lineal feet 1" pipe.....	9000	15000	36000
Price without automatic air valve.. Each	\$18.00	\$23.00	\$30.00
Price with automatic air valve..... Each	20.00	25.00	32.00

Size Number.....	2	3
Size pipe conn's inlet.....	$1\frac{1}{2}$	2
Size pipe conn's outlet.....	$1\frac{1}{4}$	$1\frac{1}{2}$
Pound water per hour.....	6000	9000
Sq. ft. of radiation.....	18000	27000
Lineal feet 1" pipe.....	54000	80000
Price without automatic air valve.. Each	\$40.00	\$60.00
Price with automatic air valve..... Each	42.00	62.00

The Empire Steam Trap is designed for low pressures not exceeding 20 pounds. Two inlets are supplied to handle any piping arrangement. Inlets and outlets have a very slight difference in elevation to make the trap adaptable where there is a minimum of head room.

When ordering state pressure under which trap is to operate.

Order by Figure Number.

STEAM SPECIALTIES, ETC.

Grinnell Sediment Strainers

Standard for 125 Lbs. Pressure

Extra Heavy for 250 Lbs. Pressure



Standard—Fig. No. 1406

Extra Heavy—Fig. No. 1407

Strainers in pipe lines are effective insurance against interruptions in service, injury to valves and expensive breakdowns. All temperature regulating valves, traps, etc., should have a strainer in the line before them.

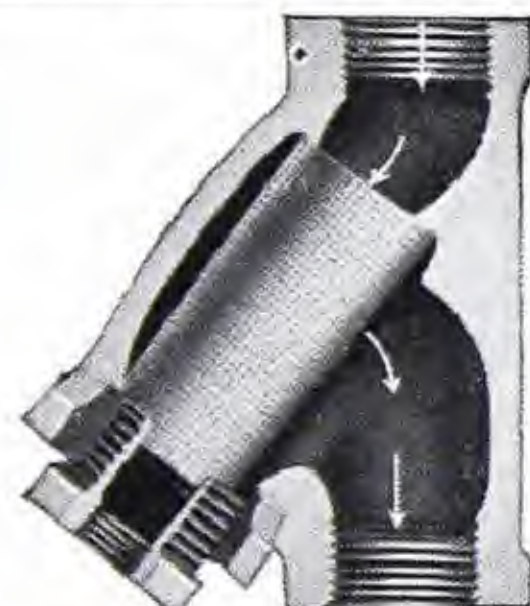
*Sizes 6, 7 and 8 made to order only.



Gasket Screen

LIST PRICES

Size.....Number	1	2	3	4	5	*6	*7	*8
Size.....Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Price, Standard.....Each	2.00	2.50	3.00	4.00	6.00	17.50	27.50	45.00
Price, Extra Heavy.....Each	2.50	3.00	3.50	5.00	7.50	.....	.....	.....
End to End, Standard.....Inches	$2\frac{3}{8}$	$2\frac{7}{8}$	$3\frac{1}{2}$	4	$4\frac{1}{8}$	$5\frac{3}{8}$	$6\frac{1}{2}$	$7\frac{5}{8}$
End to End, Extra Heavy.....Inches	$2\frac{3}{8}$	$3\frac{1}{8}$	$3\frac{3}{4}$	$4\frac{3}{8}$	5	.....	.....	.....



Type S. B.

Sarco Strainers

For Steam Pressures up to 125 Lbs.

A strainer installed in the pipe line ahead of a trap, temperature regulating valve, etc., is an inexpensive and effective insurance against costly shutdowns and damage to costly apparatus.

LIST PRICES—Fig. No. 1408

Size.....Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Price.....Each	2.50	2.50	3.20	3.50	4.15	4.50	5.00	7.90	10.50	12.50
End to End.....Inches	3	$3\frac{3}{8}$	$3\frac{7}{8}$	$4\frac{5}{8}$	$5\frac{3}{4}$	$6\frac{3}{4}$	$7\frac{1}{4}$	$8\frac{3}{8}$	$9\frac{1}{2}$	$10\frac{1}{2}$



Swartwout Sediment Strainers

For Steam Pressures up to 250 Lbs.

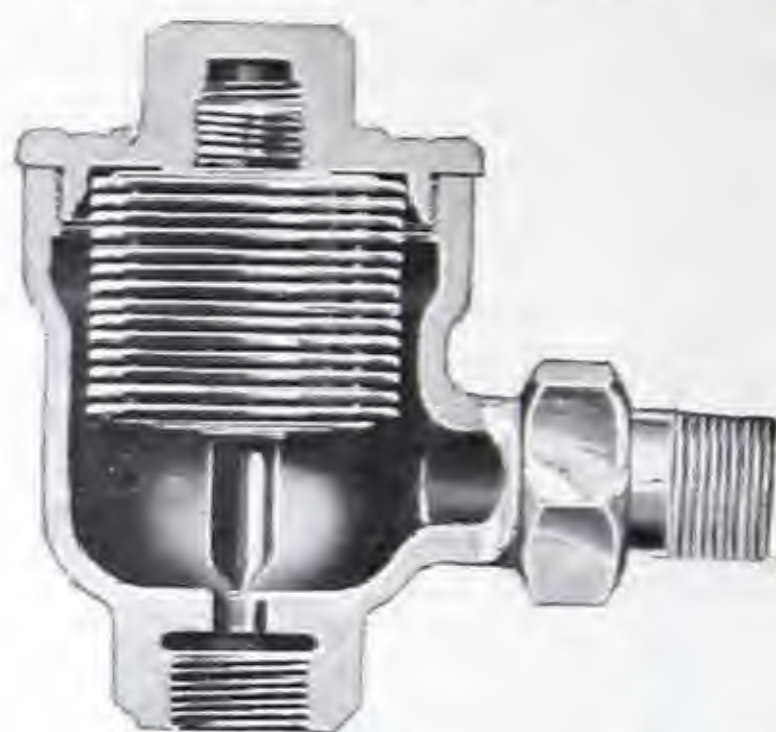
A strainer, simple and inexpensive as it is when installed ahead of a trap, etc., prevents scale and other foreign matter from getting into the mechanism of traps, etc., insuring continuous service.

LIST PRICES—Fig. No. 1409

Size.....Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Price.....Each	7.15	7.15	11.40	11.40	20.00	20.00
End to End.....Inches	$4\frac{1}{4}$	$4\frac{1}{4}$	$6\frac{1}{8}$	$6\frac{1}{8}$	$6\frac{3}{8}$	$6\frac{3}{8}$

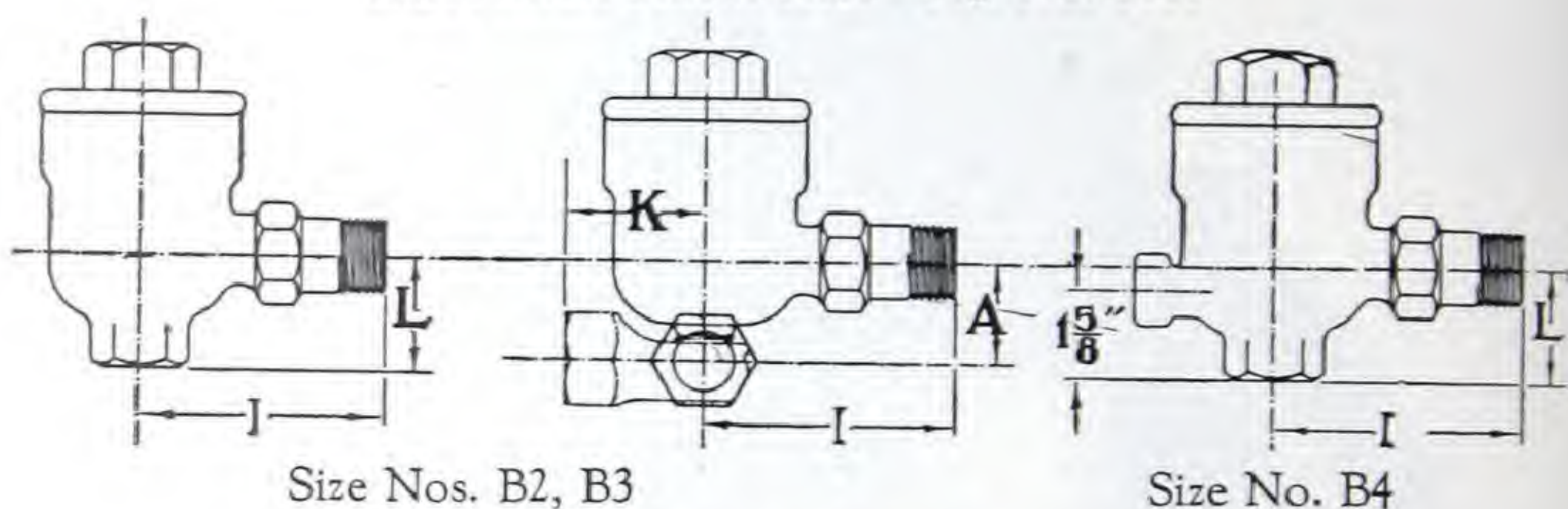
Order by Figure Number.

STEAM SPECIALTIES, ETC.

Trane Bellows Radiator Traps

Standard Pressure Bellows Traps—Fig. No. 1618

High Pressure Bellows Traps—Fig. No. 1619



LIST PRICES

Size No.	Size Inches	List Prices		Capacity—Standard Trap—in Sq. Ft. at Pressure Differences of			
		Std. Press. Fig. No. 1618	High Press. Fig. No. 1619	4 Oz.	8 Oz.	1 Lb.	2 Lb.
		Each	Each				
B2	$\frac{1}{2}$	\$5.40	\$ 9.00	125	175	245	344
B3	$\frac{3}{4}$	9.00	12.00	375	525	735	1030
B4	1	14.00	20.00	750	1050	1700	2200

DIMENSIONS—Fig. Nos. 1618, 1619

Size No.	Size Inches	Dimensions in Inches			
		A	I	K	L
B2	$\frac{1}{2}$	$1\frac{3}{32}$	$3\frac{1}{4}$	$1\frac{7}{8}$	$1\frac{1}{16}$
B3	$\frac{3}{4}$	$1\frac{3}{32}$	$3\frac{1}{4}$	$1\frac{7}{8}$	$1\frac{1}{16}$
B4	1	....	$3\frac{9}{16}$	....	$1\frac{3}{32}$

$\frac{1}{2}$ and $\frac{3}{4}$ -inch Standard Pressure Traps are made in Angle and Swivel Patterns. Swivel Pattern can be used as Straightway, or R.H. or L.H. Corner Patterns.

1-inch Standard and all sizes of High Pressure Traps are made in Angle Pattern only.

Standard Pressure Bellows Traps, maximum operating range = 15 inches Vacuum to 25 pounds pressure.

High Pressure Bellows Traps are for working pressures up to 125 pounds. State pressure when ordering.

Order by Figure and Size Numbers.

STEAM SPECIALTIES, ETC.

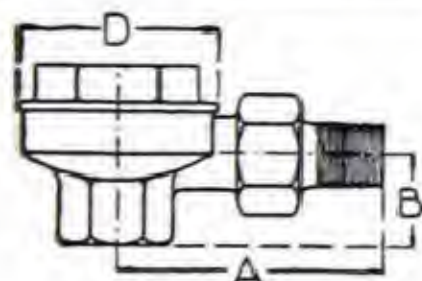
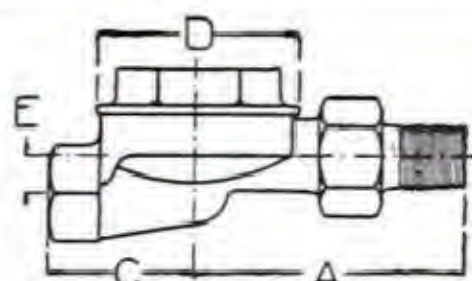
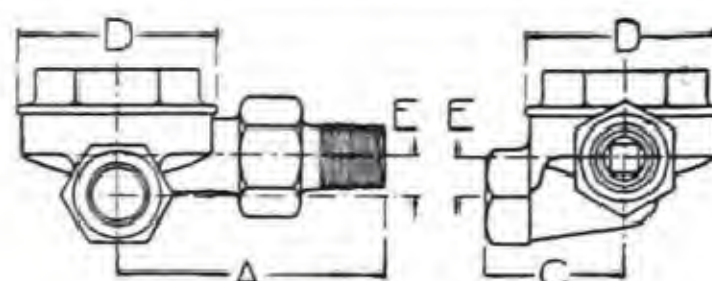
Dunham
Radiator
Traps

Fig. No. 1608
For Vapor and
Low Pressure
Return Line
Heating Systems,
also Kitchen
and Laundry
Equipment, etc.,
where pressures
are not in excess
of 10 pounds

LIST PRICES

Angle Pattern
Trap No. 3Left Hand Pattern
Trap No. 3Straightway Pattern
Trap No. 3Right Hand Pattern
Trap No. 3

Size No.	Style	Price Each	Size Tapping Inches	Capacity Direct Radiation Square Feet	DIMENSIONS IN INCHES				
					A	B	C	D	E
No. 1	Angle	\$8.00	1/2-inch	100	3 1/4	1 1/8	...	2 7/16	...
	St'way	8.00	"	"	3 1/4	...	1 3/4	2 7/16	1/2
	R. Hand	8.00	"	"	3 1/4	...	1 3/4	2 7/16	1/2
	L. Hand	8.00	"	"	3 1/4	...	1 3/4	2 7/16	1/2
No. 2	Angle	\$10.00	1/2-inch	350	3 13/16	1 1/4	...	3 15/16	...
	St'way	10.00	"	"	3 13/16	...	2 5/8	3 15/16	1/2
	R. Hand	10.00	"	"	3 13/16	...	2 5/8	3 15/16	1/2
	L. Hand	10.00	"	"	3 13/16	...	2 5/8	3 15/16	1/2
No. 3	Angle	\$13.00	3/4-inch	800	3 7/8	1 1/4	...	3 15/16	...
	St'way	13.00	"	"	3 7/8	...	2 5/8	3 15/16	3/8
	R. Hand	13.00	"	"	3 7/8	...	2 5/8	3 15/16	3/8
	L. Hand	13.00	"	"	3 7/8	...	2 5/8	3 15/16	3/8

Angle Pattern
No. 1 TrapStraightway Pattern
No. 1 TrapRight hand Pattern
No. 1 Trap

(Dimensions of Left Hand Pattern are the same as those of the Right Hand Pattern)

The Nos. 1, 2 and 3 Traps are regularly furnished nickel-plated, and with union nut and nipple, threaded right hand. Supplied in angle, straightway, right hand, or left hand pattern. Bronze body and cover.

When not otherwise stipulated on order the regular Angle Pattern Traps of size called for will be shipped.

When ordering, specify style.

Order by Figure and Size Numbers.

STEAM SPECIALTIES, ETC.

Dunham Heavy Duty Traps

Dunham Traps Nos. 4 and 5 are used where large amounts of condensation must be handled, such as Large Coils, Vento Stacks, Dripping Main Steam Heating Risers and at the ends of Large Heating Mains.

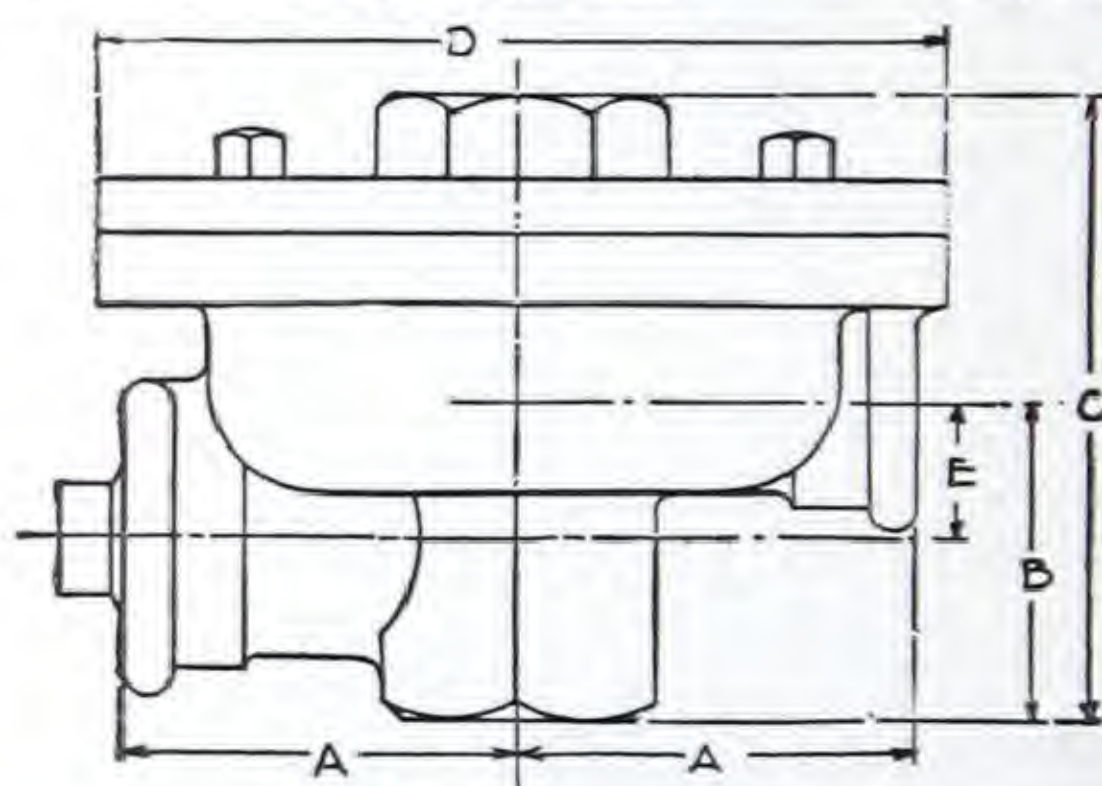


Trap No. 4



Trap No. 5

Fig. No. 1609



Traps Nos. 4 and 5

LIST PRICES

Size No.	Style	Price Each	Size Tapping Inches	Capacity Direct Radiation Square Feet	DIMENSIONS				
					A	B	C	D	E
4	Angle	\$18.00	$\frac{3}{4}$	1,500	$2\frac{3}{4}$	$2\frac{5}{16}$	$4\frac{9}{32}$	$5\frac{7}{8}$	$1\frac{1}{16}$
	St'way	18.00	$\frac{3}{4}$	1,500	$2\frac{3}{4}$	$2\frac{5}{16}$	$4\frac{9}{32}$	$5\frac{7}{8}$	$1\frac{1}{16}$
5	Angle	30.00	1	3,000	3	$2\frac{7}{8}$	$5\frac{5}{16}$	$7\frac{5}{8}$	$1\frac{5}{16}$
	St'way	30.00	1	3,000	3	$2\frac{7}{8}$	$5\frac{5}{16}$	$7\frac{5}{8}$	$1\frac{5}{16}$

The Nos. 4 and 5 Traps are painted battleship gray and furnished in either Angle or Straightway patterns with female right hand threaded connections, both inlet and outlet. Cast iron body and cover.

When not otherwise specified the regular angle pattern traps of size called for will be shipped.

Order by Figure and Size Numbers.

STEAM SPECIALTIES, ETC.
Penberthy "Radio" Radiator Valves
For Steam and Hot Water



Steam, Female Ends
 Fig. No. 580

"Radio" Valves for Steam have Composition Disc the same as in the "Compodisk" Valves shown on page 528.



Steam, Union End
 Fig. No. 581



Union Elbow
 Fig. No. 584



H.W. Female End
 Fig. No. 582

"Radio" Valves for Hot Water are Quick Opening (Sleeve Type). They are vented to permit a slight circulation of water through the radiator at all times.



H.W. Union End
 Fig. No. 583

LIST PRICES—Fig. Nos. 580, 581

Size.....Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Fig. No. 580.....Each	\$3.40	\$3.85	\$4.50	\$5.65	\$7.40	\$12.10
Fig. No. 581.....Each	3.70	4.30	5.10	6.40	8.40	13.60

LIST PRICES—Fig. Nos. 582, 583, 584

Size.....Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Fig. No. 582.....Each	\$2.95	\$3.25	\$3.90	\$5.00	\$6.30	\$10.50
Fig. No. 583.....Each	3.25	3.70	4.50	5.75	7.30	12.00
Fig. No. 584.....Each	1.75	2.00	2.50	3.30	4.25	7.20

These valves are furnished with rough body and polished Trimmings, nickle plated all over.

Order by Figure Number.

STEAM SPECIALTIES, ETC.

*Jenkins Radiator Valves**Regular Pattern**Rough Body
Nickel Plated all Over**Composition Wheels*Angle, Screwed
Fig. No. 490Globe, Male Union
(Not Illustrated)
Fig. No. 497Angle, Male Union
Fig. No. 491

LIST PRICES—Fig. Nos. 490, 491, 497

Size.....Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$
Fig. No. 490.....Each	\$3.40	\$3.85	\$4.50	\$5.65	\$7.40
Fig. Nos. 491, 497.....Each	3.70	4.30	5.10	6.40	8.40

*Jenkins Radiator Valves**For Hot Water**Rough Body
Nickel Plated all Over**Composition Wheels*Angle, Screwed
Fig. No. 493Union Elbow
Fig. No. 495Angle, Male Union
Fig. No. 494

LIST PRICES—Fig. Nos. 493, 494, 495

Size.....Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$
Fig. No. 493.....Each	\$2.95	\$3.25	\$3.90	\$5.00	\$6.30
Fig. No. 494.....Each	3.25	3.70	4.50	5.75	7.30
Fig. No. 495.....Each	1.75	2.00	2.50	3.30	4.25

Hot Water Radiator Valves, Fig. Nos. 493 and 494, open with a quarter turn of the wheel, have full opening equal to the nominal diameter of the pipe, also a small hole drilled in plug to permit a slight circulation of water through the radiator at all times.

Union Elbows, Fig. No. 495, have same center to end dimensions as Fig. No. 494.
Order by Figure Number.

STEAM SPECIALTIES, ETC.

*Jenkins Radiator Valves**Heavy Pattern—Composition Wheels*Globe, Screwed
Fig. No. 165Angle, Screwed
Fig. No. 166Globe, Male Union
Fig. No. 167Angle, Male Union
Fig. No. 168

LIST PRICES—Fig. Nos. 165, 166

Size.....Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Rough Body, Plated all over.....Each	\$1.90	2.25	2.40	2.90	3.60	4.90	6.65	10.90
Finished and Plated all over.....Each	2.40	2.70	2.90	3.40	4.15	5.65	7.65	12.15

LIST PRICES—Fig. Nos. 167, 168

Size.....Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Rough Body, Plated all over.....Each	\$3.00	3.00	3.15	3.90	4.70	6.25	8.15	13.00
Finished and Plated all over.....Each	3.45	3.45	3.60	4.40	5.20	6.80	9.15	14.25

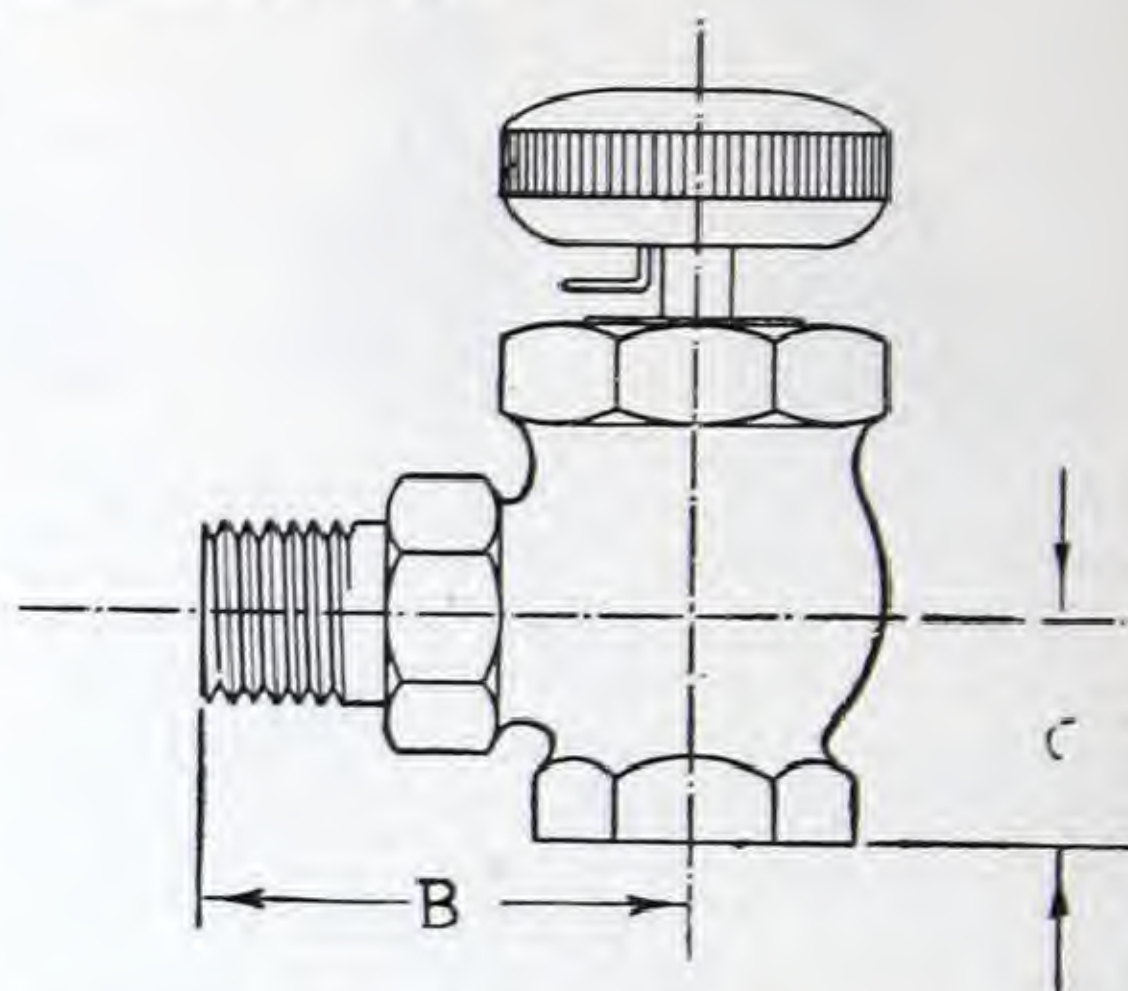
Gate Valve with Lock Shield
Fig. No. 307AWith Composition Wheel
(Not Illustrated)
Fig. No. 307Tee Handle
Key
Fig. No.
171Union Gate Valve
With Composition Wheel
Fig. No. 308
With Lock Shield (Not Ill.)
Fig. No. 308A

LIST PRICES—Fig. Nos. 307, 307A, 308, 308A, 171

Size.....Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Fig. No. 307						
Rough Body, Plated all over...Each	\$2.40	3.00	3.85	5.00	6.60	9.65
Finished and Plated all over...Each	3.70	4.50	5.60	7.35	9.70	14.80
Fig. No. 307A						
Rough Body, Plated all over...Each	3.05	3.70	4.70	6.00	7.80	11.35
Finished and Plated all over...Each	4.35	5.20	6.45	8.35	10.90	16.50
Fig. No. 308						
Rough Body, Plated all over...Each	3.65	4.25	5.20	6.60	9.00	12.80
Finished and Plated all over...Each	4.90	5.75	7.00	9.00	12.00	17.90
Fig. No. 308A						
Rough Body, Plated all over...Each	4.30	4.95	6.05	7.60	10.20	14.50
Finished and Plated all over...Each	5.55	6.45	7.85	10.00	13.20	19.60
Fig No. 171—Tee Handle Key.....Each	.25	.25	.30	.30	.40	.40

Order by Figure Number and specify finish wanted.

STEAM SPECIALTIES, ETC.

*Trane Bellows Packless Radiator Valves**For Steam Pressures up to 25 Lbs.*

Standard Pattern, with Round Wheel—Fig. No. 1620

Special Pattern, with Lever Handle—Fig. No. 1620-A

Special Pattern, with Lock and Shield—Fig. No. 1620-B

LIST PRICES

Size Ins.	Price, Each		Capacities in Sq. Ft. at Various Pressure Differences				Dimensions in Inches	
	Fig. Nos. 1620 1620-A	Fig. No. 1620-B	4 Oz.	8 Oz.	1 Lb.	2 Lb.	B	C
$\frac{1}{2}$	\$5.00	\$5.40	20	28	39	55	$2\frac{3}{4}$	$1\frac{5}{16}$
$\frac{3}{4}$	5.00	5.40	64	90	125	175	$2\frac{3}{4}$	$1\frac{5}{16}$
1	5.75	6.20	149	210	294	410	3	$1\frac{3}{8}$
$1\frac{1}{4}$	7.65	8.00	375	525	735	1030	$3\frac{1}{2}$	$1\frac{3}{4}$

Keys for Lock and Shield Valves..... Each \$0.40

The standard pattern of Trane Packless Radiator Valves are furnished with Round Wheels finished in glossy black.

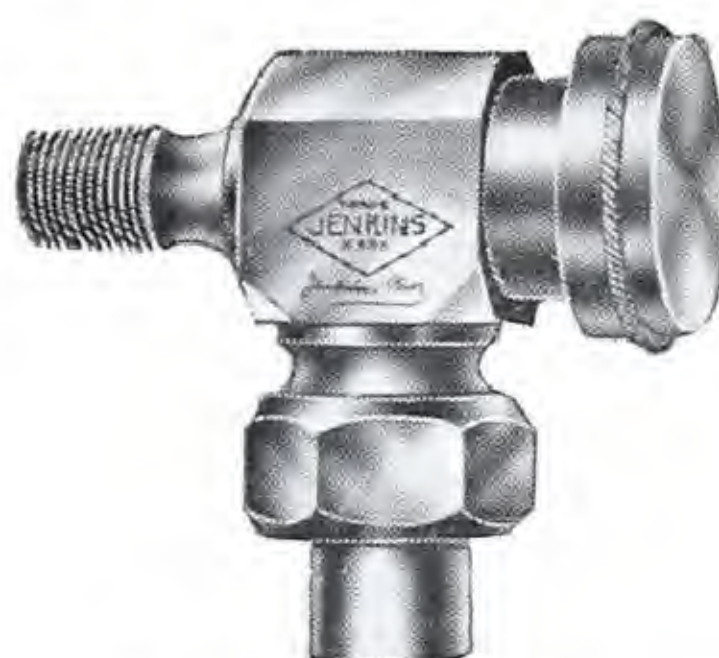
Special Valves are furnished with Lever Handles or with Lock and Shield. Also with Extension Handles, prices on application.

These Valves are furnished with rough body, finished trimmings, and nickel-plated all over.

Each Valve is fully guaranteed by the manufacturers for a period of 5 years.

Order by Figure Number.

STEAM SPECIALTIES, ETC.

*Jenkins Automatic Air Valves**Jenkins Diamond Traps**For Pressures not over 80 Lbs.*Automatic Air Valve
Fig. Nos. 190, 240Drip Cup
Fig. No. 191Automatic Air Valve
With Union—Fig. No. 193

LIST PRICES—Fig. Nos. 190, 191, 193

Fig. No. 190, 1/8-inch	Per Dozen	\$ 7.50
Fig. No. 190, 1/4-inch	Per Dozen	7.50
Fig. No. 191, Drip Cup	Per Dozen	2.00
Fig. No. 193, 1/8-inch Inlet, 1/8-inch Union	Per Dozen	9.50
Fig. No. 193, 1/8-inch Inlet, 1/4-inch Union	Per Dozen	10.00
Fig. No. 193, 1/4-inch Inlet, 1/4-inch Union	Per Dozen	10.00
Adjusting Screw with Composition Plug	Each	.25

LIST PRICES—Fig. No. 240

Fig. No. 240, 3/8-inch	Each	\$2.50
Adjusting Screw with Composition Plug	Each	.50

Diamond Trap
Fig. No. 212Inlet
Outlet
Sectional View—Fig. No. 212

LIST PRICES—Fig. No. 212

Size, Inches	Price, Each Fig. No. 212	Price, Each Screw with Plug	Price, Each Cap
1/2	\$3.50	\$0.80	\$0.75
3/4	4.00	1.00	.90

The thermostatic expansion and contraction of a composition plug is the principle used in the operation of the Air Valves and the Diamond Traps.

Order by Figure Number.

STEAM SPECIALTIES, ETC.

Ideal Airid Siphon Valves

Exterior View of Valve
Fig. No. 500

The Ideal Airid Siphon Valve will vent the largest radiator quickly without steam or water leak, insuring every loop steam hot. It is non-adjustable and made entirely of metal. Tenants cannot tamper with it. It is pleasing of design, highly nickel plated and polished and is guaranteed for five years. Threaded connection $\frac{1}{8}$ " pipe size. Packed 12 to a box. Weight of box of twelve, four pounds.

Fig. No. 500, Angle Connection— $\frac{1}{8}$ ".

List Price, each, \$1.60.

Fig. No. 502, straight shank— $\frac{1}{8}$ ".

List Price, each, \$2.25.

Ideal Quick Vent Valves

Fig. No. 815

For venting mains, long runs of pipe, indirect stacks, drop risers, etc., where a large amount of air must be expelled quickly. Will benefit all low pressure steam jobs by venting entire system and thereby heating all radiators quicker under less pressure. Operates by volatile liquid contained within expandible member which has diaphragm at top and bottom giving full movement of stem. All metal, very sensitive. Does not close against water. Venting port $\frac{3}{32}$ -inch diameter. Valve connection regularly $\frac{3}{4}$ -inch pipe thread. Can be furnished with $\frac{3}{8}$ -inch thread.

Fig. No. 815, nickel plated, $\frac{3}{4}$ -inch, and Fig. No. 820, $\frac{3}{8}$ -inch. List Price, each, \$3.00.

Order by Figure Number.

STEAM SPECIALTIES, ETC.

*Penberthy Radiator Air Valves**Nickle Plated*

Fig. No. 3



Fig. No. 4

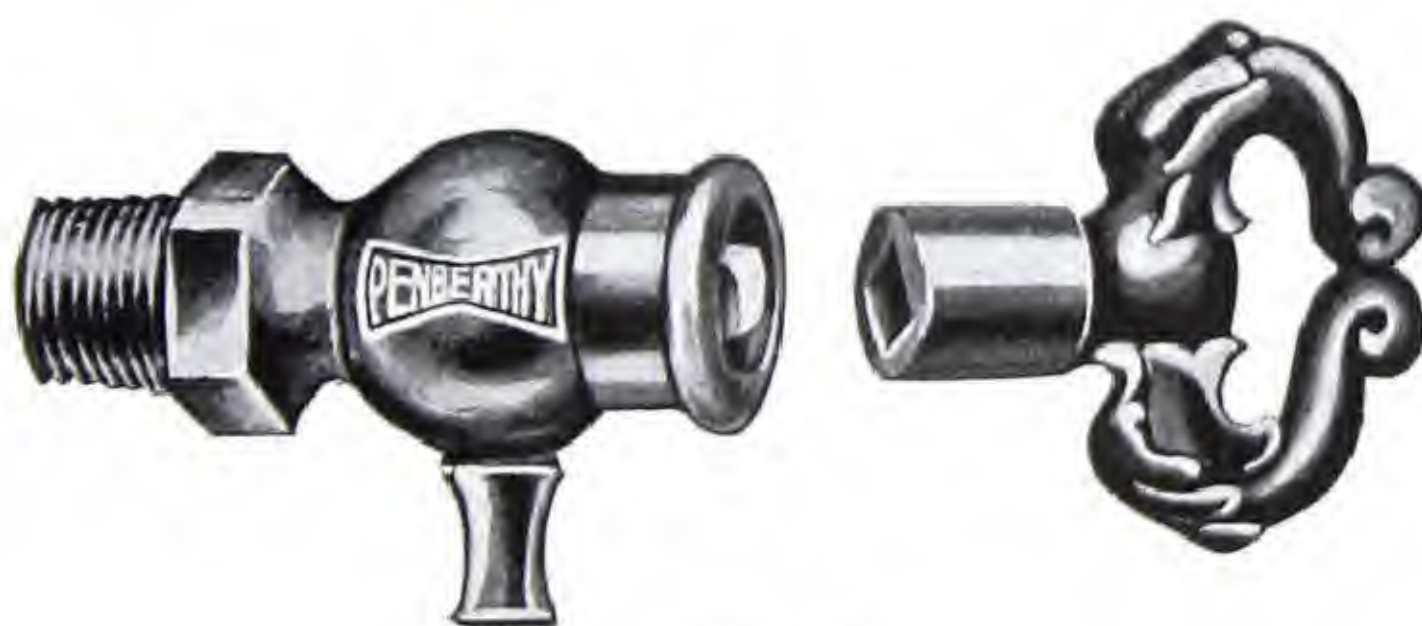


Fig. No. 5

LIST PRICES

Size.....	Inches	$\frac{1}{8}$	$\frac{1}{4}$
No. 3, Wood Wheel.....	Each	\$0.70	\$0.75
No. 4, Metal Wheel.....	Each	.70	.75
No. 5, Loose Key.....	Each	.55	.60
Extra Keys for No. 5.....	Each	.18	.18

Specify Style, Number and Size connection.

Order by Figure Number.

STEAM SPECIALTIES, ETC.

*Grinnell Air Traps**For 125 Lbs. Working Pressure*

Grinnell Air Trap (Standard)
Fig. No. 1401



Grinnell Air Trap (Special)
Fig. No. 1402

Above are shown illustrations of the Grinnell Standard and Special Air Traps which provide a simple and practical means for removing air from service mains, hot water heating systems, etc.

The Standard Air Trap (Fig. No. 1401) is most generally used and has a $\frac{3}{4}$ " connection. It is recommended in preference to the Special Air Trap, especially where velocity of flow of water is high and the space occupied by trap is not essential.

The Special Grinnell Air Trap (Fig. No. 1402) is designed primarily for use in locations where space or head room is restricted. As will be noted, it is considerably smaller than the Standard Grinnell Air Trap. The Special Air Trap has a $\frac{1}{4}$ " connection but the shell is so cast that it can be retapped to $\frac{3}{8}$ " or $\frac{1}{2}$ " if desired. Where retapping is ordered an extra charge is made. This trap is also tapped for side connection. Such side connection is for use where head room is extremely limited. However, the bottom connection is recommended in all cases where it can possibly be used.

The operation of Grinnell Air Traps is similar to a reverse action of an ordinary float steam trap. When the trap is full of air, the discharge valve opens. As the air is liberated, the water rises and when at the

STEAM SPECIALTIES, ETC.

Grinnell Air Traps (Continued)

proper level lifts the float and closes the discharge valve. The pet cock on top of the traps provides a simple and definite testing means for finding out whether or not the system is absolutely free from air at that point.

The construction of the Grinnell Air Traps is such that they make a durable appliance and will last for years under ordinary conditions.

The shell of the trap is made of heavy cast iron. The float is strong and made of seamless copper. The discharge valve is of a needle type and all parts are easily accessible by loosening the bolts and removing the cover.

The traps are suitable for a working pressure up to 125 pounds.

Below are mechanical drawings giving complete dimensions on the Grinnell Standard and Special Air Traps.

LIST PRICES AND DIMENSIONS

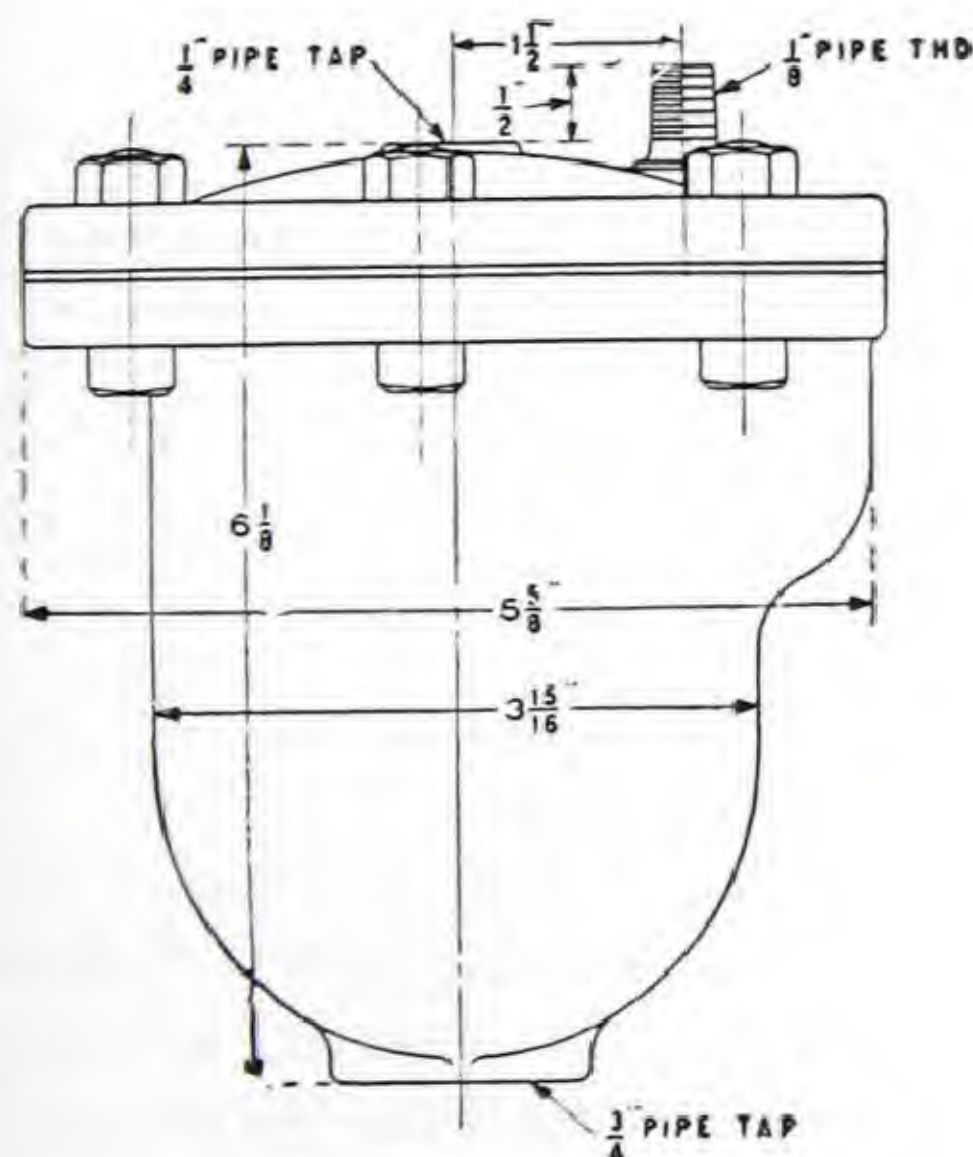


Fig. No. 1401

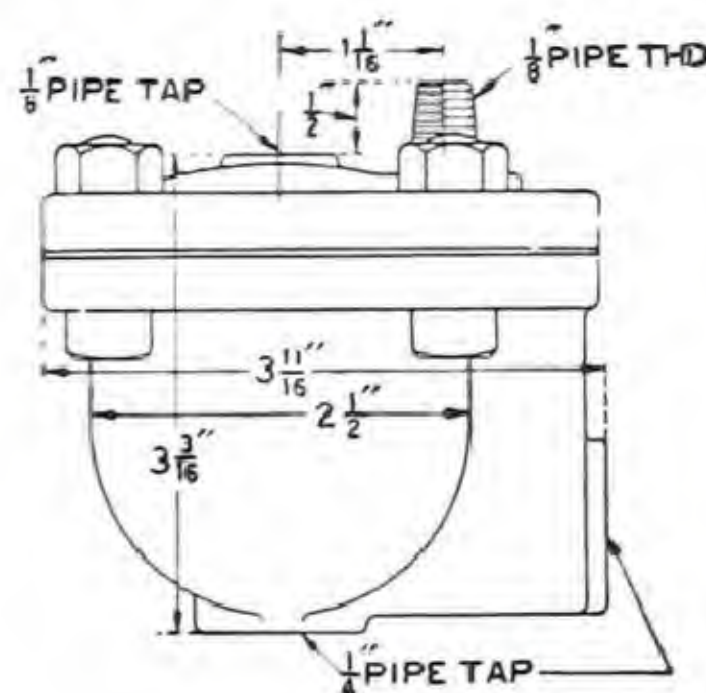


Fig. No. 1402

LIST PRICES

Fig. No. 1401.....	\$10.00
Fig. No. 1402.....	7.50

Order by Figure Number.

STEAM SPECIALTIES, ETC.

Galvanized Steel Expansion Tanks



Fig. No. 491

These tanks are made of steel, heavily galvanized, and are good for full rated capacity.

Tapping: These tanks are tapped top and bottom for 1-inch overflow and expansion pipe, and on side for feed pipe.

Note:—Special Tanks are required for "Tank-in-Basement" jobs or for any installation where tank is used under pressure.

Water Gauge Tappings— $\frac{1}{2}$ -inch—13 $\frac{1}{4}$ inches between centers.

Water Gauge Stock No. 494—List price \$1.75. Weight, packed, 1 $\frac{1}{4}$ lb.

LIST PRICES

Style No.	Price of Tank	Size Inches	Capacity Gallons	Square Feet of Radiation	Weight of Tank Pounds
1	\$8.00	12 x 20	10	300	34
2	9.00	12 x 30	15	500	47
3	12.50	14 x 30	20	700	55
4	14.00	16 x 30	26	950	71
5	15.00	16 x 36	32	1,300	78
6	16.50	16 x 48	42	2,000	93

Ideal Expansion Tank Brackets



Fig. No. 497

Order by Figure Number.

Takes in all sizes of tanks, from 10 to 16 inches diameter. Labor-saving—can be erected in two minutes. A substitute for the old-fashioned shelf at less expense. Weighs about 6 $\frac{1}{2}$ pounds and is shipped with screws packed under the slide pieces.

List price, each, complete, \$1.75.

STEAM SPECIALTIES, ETC.

McDaniel Suction Tees

(Patented)



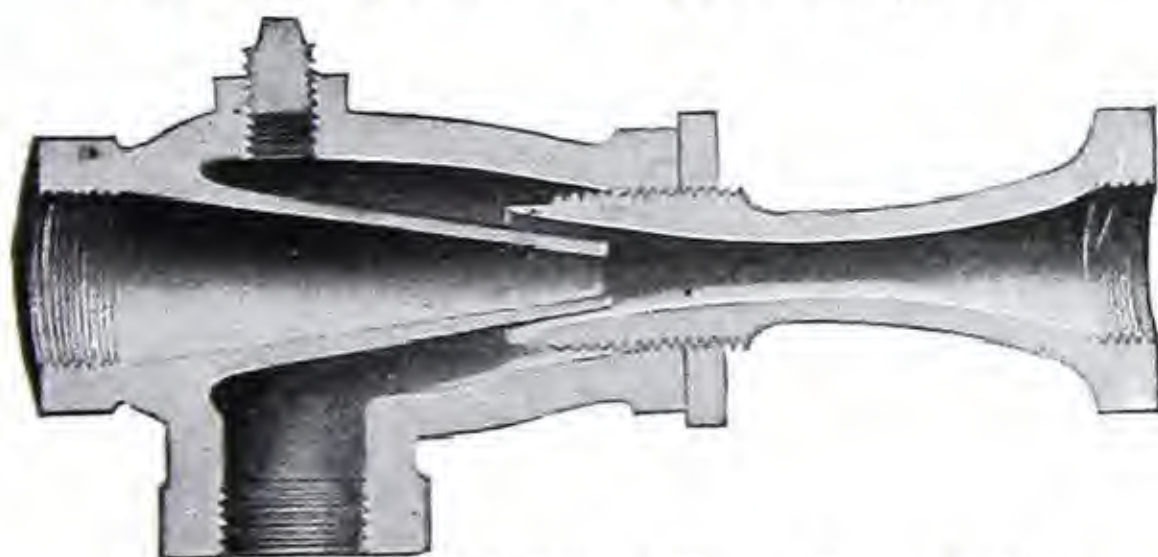
This is a fitting that will improve bad jobs of Steam Heating. Stops one Steam Connection from backing up on another, and prevents noise.

STANDARD TEES, 100 LBS. PRESSURE—Fig. No. 1565

Size.....Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Price.....Each	1.50	1.50	2.00	2.25	2.75	3.50	5.50	8.00

EXTRA HEAVY TEES, 250 LBS. PRESSURE—Fig. No. 1566

Size.....Inches	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	5	6
Price.....Each	3.50	4.50	5.50	7.50	11.00	16.00	21.00	27.00	43.00	60.00

McDaniel Water Lifters

LIST PRICES—Fig. No. 1567

Size No.	Price Each	Diameter of Pipes in Inches			CAPACITIES PER HOUR Steam at 50 Lbs.—Water Lifter near Water Level	
		Suction Inches	Discharge Inches	Size Steam Pipe to use Inches	Gallons	Cubic Feet
0	7.00	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{8}$	400	52
1	8.00	1	1	$\frac{1}{2}$	700	90
2	11.00	$1\frac{1}{4}$	$1\frac{1}{4}$	$\frac{3}{4}$	1,100	140
3	14.00	$1\frac{1}{2}$	$1\frac{1}{2}$	$\frac{3}{4}$	1,600	210
4	17.00	2	2	1	3,000	400
5	28.00	$2\frac{1}{2}$	$2\frac{1}{2}$	$1\frac{1}{4}$	5,000	660
6	35.00	3	3	$1\frac{1}{2}$	7,000	930

Order by Figure and Size Numbers.

STEAM SPECIALTIES, ETC.

*Penberthy Noiseless Water Heaters
or Steam Mufflers*

Fig. No. 351



Showing Application

LIST PRICES

Size Number	Price, Each	Pipe Size, Inches		†Capacity in U.S. Gallons
		Steam	Discharge	
F	\$1.50	$\frac{1}{4}$	$\frac{3}{8}$	50
G	1.75	$\frac{3}{8}$	$\frac{1}{2}$	60
H	2.00	$\frac{1}{2}$	1	75
J	2.50	$\frac{3}{4}$	1	100
K	3.00	1	$1\frac{1}{4}$	125
L	4.00	$1\frac{1}{4}$	$1\frac{1}{2}$	175
M	5.00	$1\frac{1}{2}$	2	250
N	8.00	2	$2\frac{1}{2}$	500

The use of this Heater does away with all noise such as otherwise occurs when heating a tank or barrel of water or other liquid with steam. Of special value to creameries, chemical works, etc.

It has no couplings and no loose parts to get out of order. Simply put a piece of pipe, 10 to 12 inches long, into large end of heater and screw heater on to end of steam pipe and place below the surface of the liquid, as shown in cut, and it will heat it quickly and without waste of steam.

†Number of gallons of water heated from 70 degrees to 210 degrees in 30 minutes with 70 pounds steam pressure. In order to secure a noiseless operation, it is necessary to use a tank of sufficient capacity.

Order by Figure and Size Numbers.

STEAM SPECIALTIES, ETC.

*Penberthy Cellar Drainers**Automatic—Non-Automatic*

Automatic Cellar Drainer
Model R—Size Nos. 1, 2
Fig. No. 381



Automatic Cellar Drainer
Model L—Size Nos. 3, 4, 5
Fig. No. 367

Non-Automatic Cellar Drainers (Not Illustrated)
Fig. No. 368

LIST PRICES AND CAPACITIES

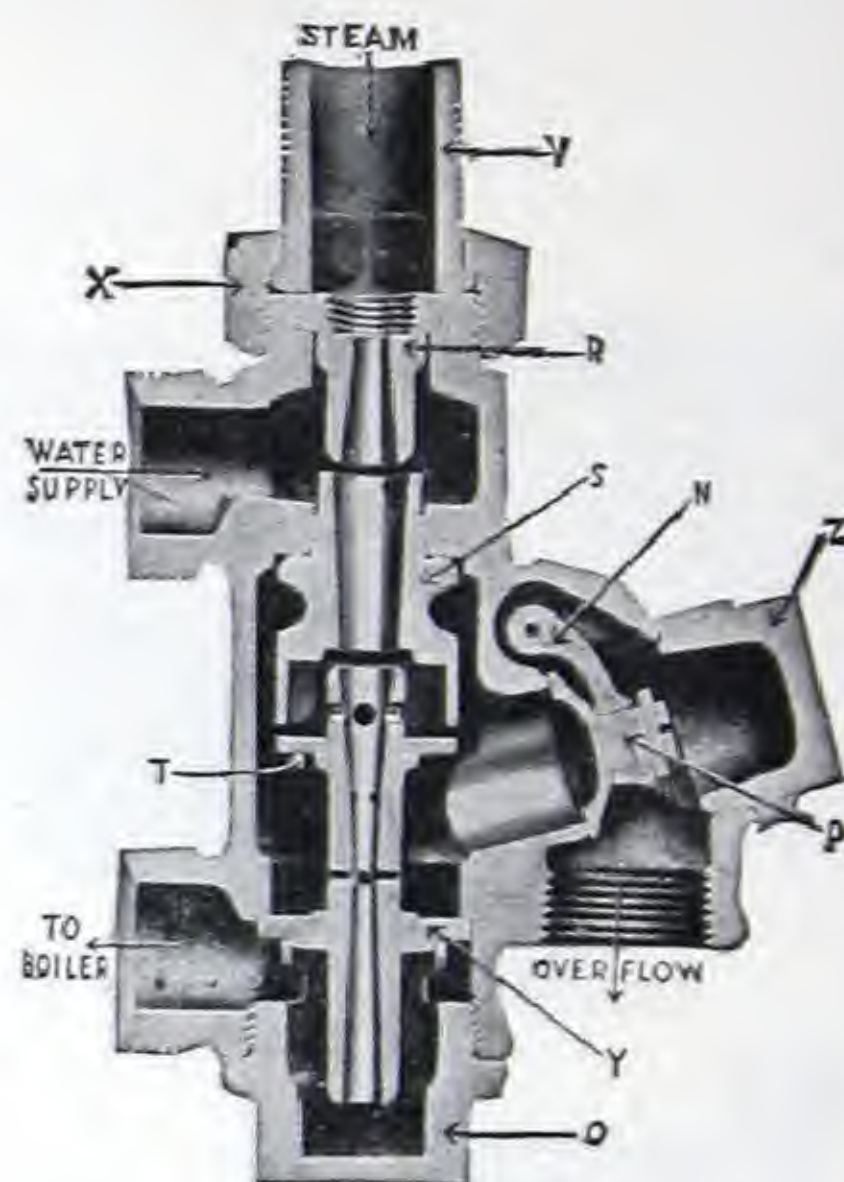
Size No.	List Prices		Pipe Sizes		U.S. Gals. per Hr. 20 to 80 lbs. Pres. 3 to 18 ft. Eleva- tion		Dimensions Over All	
	Automatic Fig. Nos. 367, 381	Non- Automatic Fig. No. 368	Supply Inches	Dis- charge Inches	Min.	Max.	Height Inches	Diam. Inches
1	\$25.00	\$15.00	$\frac{1}{2}$	1	115	720	21 $\frac{1}{2}$	10 $\frac{3}{8}$
2	40.00	25.00	$\frac{3}{4}$	1 $\frac{1}{4}$	180	1240	21 $\frac{1}{2}$	12 $\frac{7}{8}$
3	55.00	35.00	1	1 $\frac{1}{2}$	310	1650	25 $\frac{3}{8}$	15 $\frac{1}{8}$
4	80.00	50.00	1 $\frac{1}{4}$	2	450	2400	27 $\frac{1}{2}$	18 $\frac{1}{2}$
5	110.00	70.00	1 $\frac{1}{2}$	2 $\frac{1}{2}$	600	3200	27 $\frac{5}{8}$	20 $\frac{9}{16}$

NOTE:—Capacities given above represent actual gallons of water removed from pit, and not the combined discharge of operating and drainage water as given in most tables. Size Nos. 1 and 2 are designed to work on supply pressures of 10 to 100 pounds. Size Nos. 3, 4 and 5 on pressures not over 80 pounds.
Order by Figure and Size Numbers.

STEAM SPECIALTIES, ETC.

Penberthy Automatic Injectors

Automatic Injector
Fig. No. 47
† Left and Back



Automatic Injector
Fig. No. 47
Back and Back
Sectional View



Automatic Injector Repair Parts

V-Tail Pipe
X-Coupling Nut
Z-Overflow Cap
P-Overflow Valve
N-Overflow Hinge
R-Steam Jet
S-Suction Jet
Y-Delivery Jet
O-Plug

† Stock model, "Left and Back," illustrated above has Suction on Left, Overflow on Front, Discharge on Back. This model will always be furnished unless otherwise specified.

The following models can be furnished on order:—Right and Back; Left and Right; Right and Left; Front and Back; Back and Back. In designating the connections, the Suction is given first, and the Discharge last, with the Overflow always in front.

STEAM SPECIALTIES, ETC.

Penberthy Automatic Injectors

LIST PRICES—Fig No. 47

Size	Price Each	H.P. Based upon Ordinary Tubular Boiler	H.P. Based on 30 pounds Water per H.P. per Hour	Pipe Conn.	Capacity per hour 1 to 3 feet lift, 60 to 110 lbs. Steam Pressure.	
					Maximum U.S. Gal.	Minimum U.S. Gal.
O	\$15.00	3 to 6	4 to 8	1/4	60	35
OO	16.00	4 " 8	6 " 12	3/8	80	45
A	18.00	8 " 16	10 " 20	1/2	135	70
AA	20.00	12 " 22	15 " 30	1/2	180	100
B	25.00	17 " 32	22 " 45	3/4	260	140
BB	30.00	20 " 45	25 " 60	3/4	360	180
C	40.00	40 " 65	45 " 80	1	475	250
CC	45.00	45 " 80	50 " 100	1	600	325
D	55.00	50 " 100	60 " 135	1 1/4	800	425
DD	60.00	75 " 135	85 " 165	1 1/4	1000	525
E	75.00	100 " 180	125 " 235	1 1/2	1400	740
EE	90.00	115 " 255	150 " 320	1 1/2	1900	850
F	110.00	160 " 320	200 " 400	2	2400	1275
FF	125.00	200 " 400	250 " 500	2	3000	1600
G	150.00	300 " 500	325 " 600	2 1/2	3600	1875
GG	200.00	375 " 600	400 " 750	2 1/2	4200	2150

LIST PRICES OF PARTS OR REPAIRS

Size Injector.....	O or OO	A or AA	B or BB	C or CC	D or DD	E	EE	F	FF	G or GG
R—Steam Jet.....	\$0.25	\$0.35	\$0.45	\$0.55	\$0.65	\$0.75	\$0.75	\$0.85	\$1.00	\$2.00
S—Suction Jet.....	.25	.35	.45	.55	.65	.75	.75	.85	1.00	3.00
Y—Delivery Jet.....	1.25	1.50	2.00	2.50	3.00	3.75	4.50	5.50	6.50	9.00
X—Coupling Nut.....	.25	.30	.40	.50	.60	1.25	1.25	1.50	1.50	2.00
V—Tail Pipe.....	.25	.30	.40	.50	.60	.80	.80	1.00	1.00	1.25
Z—Overflow Pipe.....	.30	.40	.50	.60	.70	.80	.80	.90	.90	1.50
P—Overflow Valve.....	.40	.50	.60	.75	.90	1.00	1.10	1.25	1.25	1.75
N—Overflow Hinge.....	.10	.10	.15	.15	.15	.20	.20	.20	.20	.30
O—Plug.....	.60	.80	1.00	1.25	1.50	1.75	1.75	2.00	2.00	4.00
Strainer.....	.40	.45	.50	.55	.60	.75	.75	1.00	1.00	1.50

Where injectors are ordered by size connections we always send size having largest capacity. Order by Letter as in Size Column of table.

In ordering Injector parts do not fail to send the serial Number and Letter, which will be found on top of overflow, otherwise we must write you for this information and thus delay shipment.

In referring to or ordering parts, call them by Letter as given on opposite page.

Strainers furnished with injector are tapped one size larger than pipe connection to permit the use of a larger suction pipe if desired. A reducing bushing is supplied with each injector.

Order by Figure Number and Size Letter.

STEAM SPECIALTIES, ETC.
 Penberthy "XL-96" Improved Ejector
 Syphon or Steam Jet Pump

Lifts 22 to 25 Feet

Elevates 25 to 100 Feet

30 to 100 Lbs. Pressure



Fig. No. 250

LIST PRICES—Fig. No. 250

Size.....Number	1	2	3	4	5	6	7	8	9	10
Price, All Brass.....Each	\$8.00	10.00	15.00	20.00	25.00	35.00	50.00	70.00	105.00	145.00
Price, Iron Body, Brass Jets.....Each	Made in All Brass only				20.00	27.50	40.00	50.00	70.00	95.00
Pipe Connection, Steam, In.	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	1	1	1 $\frac{1}{4}$	1 $\frac{3}{4}$	2	2	2 $\frac{1}{2}$
Pipe Connection, Suction and Delivery.....Inches	$\frac{1}{8}$	$\frac{1}{4}$	1	1 $\frac{1}{4}$	1 $\frac{3}{4}$	2	2 $\frac{1}{2}$	3	3 $\frac{1}{2}$	4
CAPACITY PER HOUR										
40 to 65 lbs. Steam, 3 feet Lift.....Gal.	240	500	840	1350	1950	3500	5700	9500	13600	18400
20 to 40 lbs. or 65 to 100 lbs. Steam, 3 feet Lift...Gal.	235	450	700	1300	1850	3000	4350	8160	12400	17100
40 to 65 lbs. Steam, 50 feet Elevation.....Gal.	120	250	420	650	975	1750	2500	4750	6800	9200
40 to 65 lbs. Steam, 25 feet Elevation.....Gal.	180	375	625	950	1450	2600	3750	7200	10200	13800
VERTICAL LIFT										
40 to 75 lbs. Steam....Feet	23	25	25	25	25	25	25	25	25	25
25 to 40 or 75 to 100 lbs. Steam.....Feet	20	22	22	22	22	22	22	22	22	22

Sizes 5 and 6 will be sent all brass unless ordered with iron body, brass jets and steam connection.

Unless ordered in brass, sizes 7 to 10 inclusive will be shipped with iron body, brass jets and steam connection.

In ordering by size of connection specify suction and discharge, not steam connection.

When ejector is lifting 10 feet or over, we advise that the suction pipe be one size larger than the suction connection to ejector, enlarging close to ejector. A foot valve should be used on deep lifts.

When an ejector is elevating more than 20 feet, the discharge pipe should be one size larger than coupling on ejector, enlarging close to ejector.

Order by Figure and Size Numbers.

LUBRICATING DEVICES
Penberthy Sight-Feed Lubricators
 Brass Body



"Peerless" Sight-Feed

Double Connection—Fig. No. 420

Single Conn. (Not Ill.)—Fig. No. 419



"Polar Sight-Feed"

Single Connection—Fig. No. 557

Double Conn. (Not Ill.)—Fig. No. 558

LIST PRICES—Fig. Nos. 419, 420

Size of Lubricator (Capacity).....	$\frac{1}{3}$ Pint	$\frac{1}{2}$ Pint	1 Pint	1 Quart
Pipe Connection.....Inches	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
Fig. No. 420, Polished Brass.....Each	\$16.00	\$17.00	\$21.20	\$24.70
Fig. No. 419, Polished Brass.....Each	16.50	17.50	21.70	25.20

LIST PRICES—Fig. No. 557, 558

Size of Lubricator (Capacity).....	$\frac{1}{3}$ Pint	$\frac{1}{2}$ Pint	1 Pint	1 Quart
Pipe Connection.....Inches	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{1}{2}$
Fig. No. 557, Polished Brass.....Each	\$10.20	\$10.80	\$13.40	\$15.10
Fig. No. 558, Polished Brass.....Each	9.80	10.40	13.00	14.70

The Peerless Lubricator is strictly high-grade, and is specially designed for stationary and marine engines. Will feed heavy oils and work well in cold weather. The Double Connection, Fig. No. 420, is recommended for use where the space permits in preference to the Single Connection, Fig. No. 419.

The Polar Lubricator is built principally for outdoor service, and is specially adapted for portable and traction engines, hoisting engines, steam pumps, etc.

Polished Brass Lubricators are furnished unless otherwise specified.

Order by Figure Number.

LUBRICATING DEVICES

*Detroit Sight-Feed Lubricators**Improved Standard**For Stationary Engines*

Single Connection
Fig. No. 1573



Double Connection
Fig. No. 1574

LIST PRICES

Size of Lubricator (capacity).....	$\frac{1}{3}$ pt.	$\frac{1}{2}$ pt.	1 pt.
Pipe Connection.....Inches	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
Brass, Single Connection.....Each	\$17.00	\$20.00	\$23.00
Brass, Double Connection.....Each	17.00	22.00	30.00
Size of Lubricator (capacity).....	1 qt.	2 qts.	
Pipe Connection.....Inches	$\frac{1}{2}$	$\frac{3}{4}$	
Brass, Single Connection.....Each	\$28.00	.....
Brass, Double Connection.....Each	45.00	\$60.00	

Order by Figure Number.

LUBRICATING DEVICES

*Penberthy Plain Engine Lubricators**Polished Brass*

With Wood Wheels—Fig. No. 400-A

With Iron Wheels—Fig. No. 402-A

LIST PRICES

Size	Number	1	2	3	4	5	6
Fitted with Cock and Tube	Each	\$3.40	\$3.60	\$3.90	\$4.25	\$4.75	\$5.75
Plain, without Cock and Tube	Each	2.40	2.60	2.90	3.25	3.75	4.75
Shank Pipe Thread	Inch	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{4}$
Capacity (Oil)	Ounces	1 $\frac{1}{4}$	1 $\frac{1}{2}$	2 $\frac{1}{2}$	4	5	10
Diameter	Inches	1 $\frac{1}{2}$	1 $\frac{3}{4}$	2	2 $\frac{1}{4}$	2 $\frac{1}{2}$	3

Fitted with Wood or Iron Wheels. With or Without Cock and Tube.

Unless otherwise specified, these Lubricators will be fitted with Wood Wheels and with Cock and Tube.

These Lubricators are recommended for use on traction and stationary engines and steam pumps. Made from heavy castings, are strong and durable. The filler end of the oil body is made with a square thread, and when the filler plug, the seat of which is made of soft metal, is screwed down in place it makes a very tight connection, insuring both strength and safety on high pressures.

Order by Figure and Size Numbers.

LUBRICATING DEVICES

*Lunkenheimer "Alpha" Hand Oil Pump**For 250 Pounds Working Steam Pressure*

Fig. No. 495

LIST PRICES

Size.....	Number	3	5	6	8
Price, Finished Bronze.....	Each	7.50	8.50	10.00	15.00
Extra Glasses, Fig. No. 526.....	Each	1.00	1.30	1.90	4.30
Extra Cork Washers, Fig. No. 1062.....	Per Dozen	1.30	1.70	2.10	3.50
Outside Diameter of Glass.....	Inches	2¼	3	3½	4¼
Height of Glass.....	Inches	2½	3	4	5
Capacity.....		⅛ Pint	½ Pint	1 Pint	1 Qt.
Shank Pipe Thread.....	Inch	⅜	⅜	½	½

The Lunkenheimer Glass Body Oil Pump is easily filled and operated and is intended to be used in connection with Sight-Feed Lubricators on Stationary or Marine Engines. No large engine should be without a pump of this kind as an auxiliary to the Sight-Feed Lubricator.

These pumps are made in four sizes, ranging in capacity from ⅛ pint to one quart.

Great care is exercised in the manufacture of these Pumps, and they are tested thoroughly before being sent out from factory, and are guaranteed to be perfect and first-class in every way.

Finished Brass Oil Pumps will be furnished unless otherwise specified.

When ordering, specify Figure Number and Size Number.

LUBRICATING DEVICES

*Penberthy Glass Body Oil Cups**Brass Base and Top.**For use on Stationary Bearings*

"Slide Top"
Solid Shank Oil Cup
Fig. No. 193



"Sancho"
Sight Feed Oil Cup
Fig. No. 194

LIST PRICES—Fig. No. 193

Size.....Number	300	301	302	303	304	305	306	307
Brass Finish.....Each	\$0.85	\$1.00	\$1.25	\$1.50	\$2.00	\$2.50	\$3.60	\$5.10
Nickel Plated.....Each	1.00	1.20	1.50	1.80	2.30	2.80	4.00	5.60
Shank Pipe Thread.....Inch	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
Capacity (Oil).....Ounces	$\frac{5}{8}$	1	$1\frac{1}{4}$	$2\frac{1}{4}$	4	5	10	18
Height of Glass.....Inches	$1\frac{1}{8}$	$1\frac{3}{8}$	$1\frac{1}{2}$	$1\frac{3}{4}$	$2\frac{1}{8}$	$2\frac{3}{8}$	3	4
Outside Diam. Glass...Inches	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	2	$2\frac{1}{4}$	$2\frac{1}{2}$	3	$3\frac{1}{2}$
Extra Body Glasses.....Each	\$0.08	.10	.11	.12	.15	.25	.40	.65
Extra Washers.....Dozen	.12	.18	.24	.30	.36	.42	.52	.64

LIST PRICES—Fig. No. 194

Size.....Number	600	601	602	603	604	605	606	607
Brass Finish.....Each	\$1.25	1.50	1.75	2.10	2.55	3.15	4.35	5.65
Nickel Plated.....Each	1.50	1.80	2.10	2.50	3.00	3.65	4.90	6.35
Shank Pipe Thread.....Inch	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
Capacity (Oil).....Ounces	$\frac{5}{8}$	1	$1\frac{1}{4}$	$2\frac{1}{4}$	4	5	10	18
Height of Glass.....Inches	$1\frac{1}{8}$	$1\frac{3}{8}$	$1\frac{1}{2}$	$1\frac{3}{4}$	$2\frac{1}{8}$	$2\frac{3}{8}$	3	4
Outside Diam. Glass...Inches	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	2	$2\frac{1}{4}$	$2\frac{1}{2}$	3	$3\frac{1}{2}$
Extra Body Glasses.....Each	\$0.08	.10	.11	.12	.15	.25	.40	.65
Extra Washers.....Dozen	.12	.18	.24	.30	.36	.42	.52	.64

Fitted with Spring Hinged Oil Hole Cover.

Feed is instantly shut off by screwing down regulating stem to its seat

Brass Finish Cups are furnished unless otherwise specified.

Order by Figure and Size Numbers.

LUBRICATING DEVICES

*Penberthy Glass Body Oil Cups**Brass Base and Top**Sight Feed Type*

"Salute" Snap Lever
Sight Feed Oil Cup
Fig. No. 131



"Sultan" Gas Engine
Cylinder Oil Cup
Fig. No. 132

LIST PRICES—Fig. No. 131

Size.....Number	550	551	552	553	554	555	556	557
Brass Finish.....Each	\$3.00	\$3.25	\$3.50	\$3.75	\$4.25	\$5.25	\$7.25	\$ 9.25
Nickel Plated.....Each	3.50	3.75	4.00	4.25	4.75	5.75	8.00	10.25
Shank Pipe Thread.....Inch	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
Capacity (Oil).....Ounces	$\frac{5}{8}$	1	$1\frac{1}{4}$	$2\frac{1}{4}$	4	5	10	18
Height of Glass.....Inches	$1\frac{1}{8}$	$1\frac{3}{8}$	$1\frac{1}{2}$	$1\frac{3}{4}$	$2\frac{1}{8}$	$2\frac{3}{8}$	3	4
Outside Diam. Glass.....Inches	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	2	$2\frac{1}{4}$	$2\frac{1}{2}$	3	$3\frac{1}{2}$
Extra Body Glasses.....Each	\$0.08	.10	.11	.12	.15	.25	.40	.65
Extra Washers.....Dozen	.12	.18	.24	.30	.36	.42	.52	.64

LIST PRICES—Fig. No. 132

Size.....Number	652	653	654	655	656	657
Brass Finish.....Each	\$2.00	\$2.80	\$3.50	\$4.00	\$5.40	\$7.00
Nickel Plated.....Each	2.40	3.25	4.10	4.60	6.25	8.20
Shank Pipe Thread.....Inch	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
Capacity (Oil).....Ounces	$1\frac{1}{4}$	$2\frac{1}{2}$	4	5	10	18
Height of Glass.....Inches	$1\frac{1}{2}$	$1\frac{3}{4}$	$2\frac{1}{8}$	$2\frac{3}{8}$	3	4
Outside Diam. Glass.....Inches	$1\frac{3}{4}$	2	$2\frac{1}{4}$	$2\frac{1}{2}$	3	$3\frac{1}{2}$
Extra Body Glasses.....Each	\$0.11	.12	.15	.25	.40	.65
Extra Washers.....Dozen	.24	.30	.36	.42	.52	.64

"Salute," Fig. No. 131, is a high-grade stationary oiler. When lever is up, cup is feeding; when lever is down, feed is shut off. When lever is at 45° angle, cup flushes.

"Sultan," Fig. No. 132, is specially designed for use on Gas and Gasoline Engine Cylinders where there is a continual back pressure. Securely packed around regulating stem and at top and bottom of glasses. Ball check valve in shank prevents back pressure from entering the sight feed chamber, yet allows the oil to pass down into the cylinder of engine.

Brass Finish Cups are furnished unless otherwise specified
Order by Figure and Size Numbers.

LUBRICATING DEVICES

*Penberthy Oil Cups**Bronze—Plain Screw Lid Type**For use on Stationary Bearings*

Fig. No. 192

LIST PRICES

Size	Number	0	1	2	3
Price, without Syphon, Polished Brass . . . Each		\$0.30	\$0.35	\$0.40	\$0.50
Price, with Syphon, Polished Brass Each		.40	.45	.50	.60
Price, without Syphon, Nickel Plated . . . Each		.50	.55	.65	.75
Price, with Syphon, Nickel Plated Each		.60	.65	.75	.85
Capacity (Oil)	Ounces	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{3}{4}$
Diameter of Body	Inches	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{8}$
Shank Pipe Thread	Inch	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{1}{4}$
Size	Number	4	5	6	8
Price, without Syphon, Polished Brass . . . Each		\$0.60	\$0.90	\$1.25	\$1.75
Price, with Syphon, Polished Brass Each		.70	1.00	1.35	1.85
Price, without Syphon, Nickel Plated . . . Each		.90	1.25	1.65	2.25
Price, with Syphon, Nickel Plated Each		1.00	1.35	1.75	2.35
Capacity (Oil)	Ounces	$1\frac{1}{4}$	$1\frac{3}{4}$	$2\frac{1}{2}$	$3\frac{1}{4}$
Diameter of Body	Inches	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	2
Shank Pipe Thread	Inch	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{3}{8}$

Unless otherwise specified, cups will be furnished without syphon.

Specify finish desired when ordering.

Order by Figure and Size Numbers.

LUBRICATING DEVICES

Penberthy Grease Cups

Brass—Plain, Automatic and Screw Feed Plunger Types



“Samson”
Screw Plunger Type
Fig. No. 59



“Saturn” Plain
Compression Type
Fig. No. 199



“Silex” Automatic
Spring Compression Type
Fig. No. 98

LIST PRICES—Fig. No. 59

Size	Number	800	801	802	803	804	805	806	807
Brass Finish	Each	\$1.00	\$1.20	\$1.60	\$1.80	\$2.00	\$2.40	\$2.80	\$4.00
Nickel Plated	Each	1.20	1.45	1.90	2.10	2.40	2.90	3.40	4.75
Shank, Pipe Thread	Inch	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
Capacity (Grease)	Ounces	$\frac{1}{3}$	1	$1\frac{1}{2}$	$2\frac{1}{4}$	$3\frac{1}{4}$	$4\frac{3}{4}$	6	10
Extreme Outside Diameter	Inches	$1\frac{3}{8}$	$1\frac{5}{8}$	$1\frac{7}{8}$	$2\frac{1}{8}$	$2\frac{1}{2}$	$2\frac{3}{4}$	$3\frac{1}{8}$	$3\frac{5}{8}$
Height over all, Plunger Raised	Inches	4	$4\frac{3}{4}$	$5\frac{1}{2}$	6	$6\frac{3}{8}$	7	$7\frac{1}{2}$	$8\frac{7}{8}$

LIST PRICES—Fig. No. 98

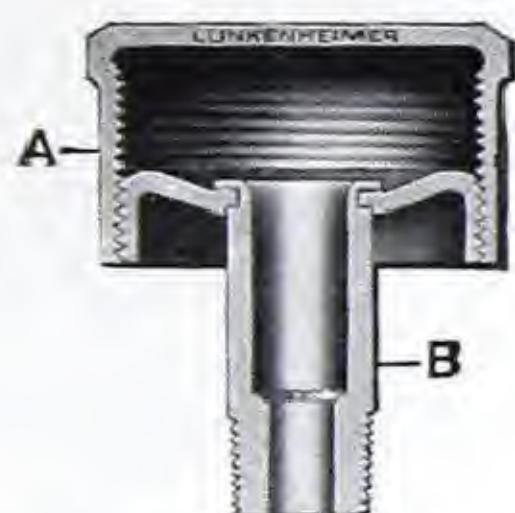
Size	Number	900	901	902	903	904	905	906	907
Brass Finish	Each	\$1.50	\$2.00	\$2.50	\$2.85	\$3.20	\$3.75	\$4.30	\$6.00
Nickel Plated	Each	1.75	2.25	2.80	3.20	3.60	4.40	5.00	6.75
Shank, Pipe Thread	Inch	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
Capacity (Grease)	Ounces	$\frac{1}{3}$	1	$1\frac{1}{2}$	$2\frac{1}{4}$	$3\frac{1}{4}$	$4\frac{3}{4}$	6	10
Extreme Outside Diameter	Inches	$1\frac{3}{8}$	$1\frac{5}{8}$	$1\frac{7}{8}$	$2\frac{1}{8}$	$2\frac{1}{2}$	$2\frac{3}{4}$	$3\frac{1}{8}$	$3\frac{5}{8}$
Height over all, Plunger Raised	Inches	4	$4\frac{3}{4}$	$5\frac{3}{8}$	$6\frac{1}{8}$	$6\frac{5}{8}$	7	$7\frac{1}{2}$	$8\frac{3}{8}$

LIST PRICES—Fig. No. 199

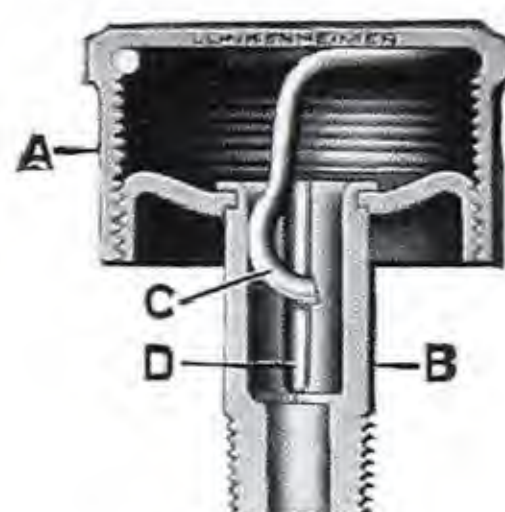
Size	Number	950	951	952	953	954	955
Polished Brass	Each	\$0.70	\$0.90	\$1.15	\$1.50	\$2.15	\$2.90
Brass, Not Polished	Each	.55	.75	.95	1.25	1.70	2.30
Nickel Plated	Each	.80	1.05	1.35	1.80	2.60	3.40
Shank, Pipe Thread	Inch	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{1}{2}$
Capacity (Grease)	Ounces	$\frac{1}{2}$	$\frac{2}{3}$	1	2	$3\frac{1}{2}$	5
Outside Diameter	Inches	$1\frac{1}{8}$	$1\frac{3}{8}$	$1\frac{1}{2}$	2	$2\frac{3}{4}$	$3\frac{1}{4}$

Order by Figure and Size Numbers.

LUBRICATING DEVICES

*Lunkenheimer Grease Cups**Steel-Compression Type*

Steel "Ferro" Plain
Fig. No. 1089



Steel "Securo"
with Internal Locking Spring
Fig. No. 1090



Steel "Teeferro"
Plain, with Tee Handle
Fig. No. 1310



Steel "Dextro"
With Internal Locking Spring
and Tee Handle
Fig. No. 1119

LIST PRICES—Fig. Nos. 1089, 1090, 1310, 1119

Size	Number	000	00	0	1	2	3	4
Price, Fig. No. 1089	Each	.40	.45	.60	.70	.85	1.20	1.80
Price, Fig. No. 1090	Each	.45	.55	.75	.85	1.00	....	....
Price, Fig. No. 1310	Each	.50	.55	.70	.80	.95	....	....
Price, Fig. No. 1119	Each	.55	.65	.85	.95	1.10	....	....
Shank Pipe Thread	Inches	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{1}{2}$
Capacity (Grease)	Ounces	$\frac{1}{8}$	$\frac{1}{2}$	$\frac{2}{3}$	1	2	$3\frac{1}{2}$	5

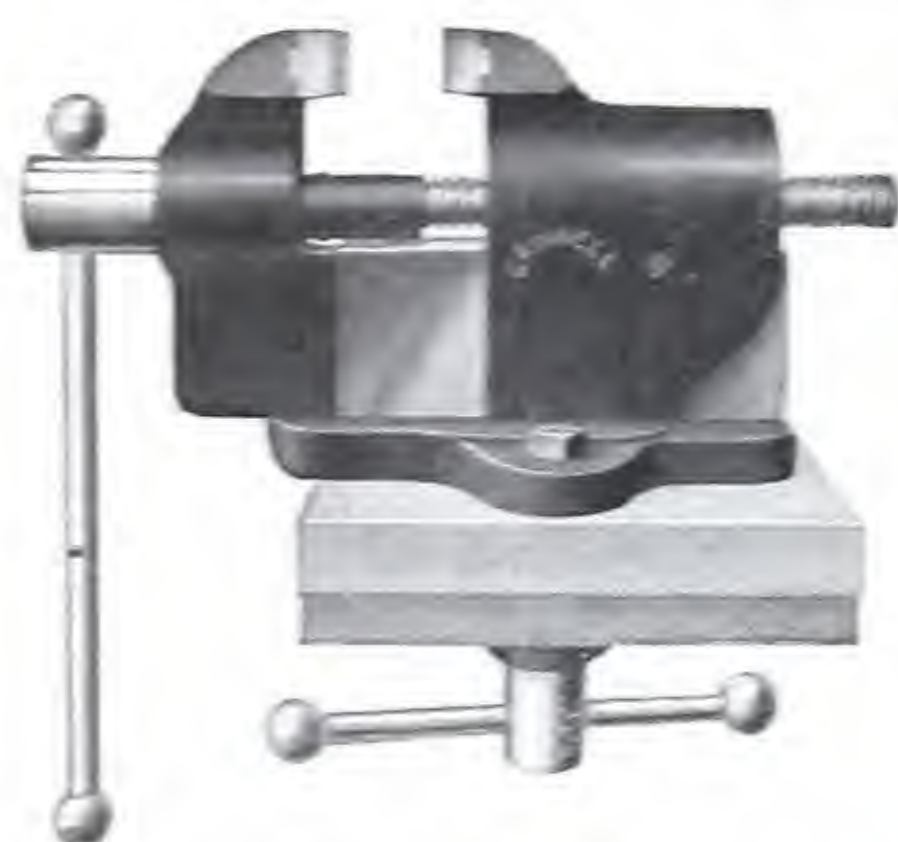
The "Teeferro" differs from the "Ferro" only in the addition of the Tee Handle.

The "Dextro" differs from the "Securo" only in the addition of the Tee Handle.

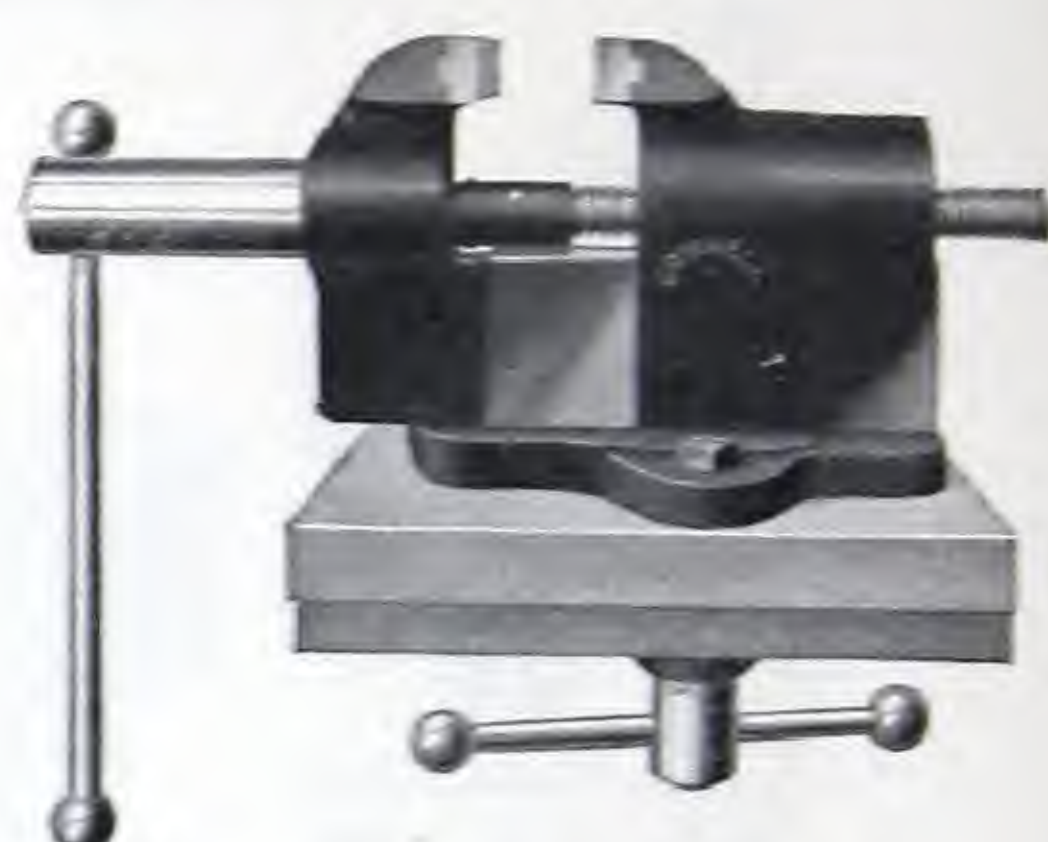
Regularly furnished in a plain steel finish. Blued steel or nickel-plated finish to order. Prices on application.

When ordering, specify Figure and Size Numbers.

TOOLS AND ACCESSORIES

Grinnell Pipe Vises

Grinnell Pipe Vise—Standard
Fig. No. 1621



Grinnell Pipe Vise—Long Shank
Fig. No. 1622

LIST PRICES—Fig. No. 1621

For Pipe Size Inches	Size Jaw Inches	Price Vise Complete	Price Set of Jaws
$\frac{1}{8}$ to 6	5	\$22.50	\$5.00

PRICE—Fig. No. 1622

An additional charge of \$5.00 Net will be made for the Grinnell Pipe Vise with Long Shank.

The Grinnell Pipe Vises illustrated above are the outgrowth of years of experience under all conditions by our own piping forces. They are in every respect an adaptable, strong and first class tool.

The jaws are easily removed and replaced when occasion demands. These jaws, unlike most types, are not only held in place by screws but are grooved into the frame and doweled.

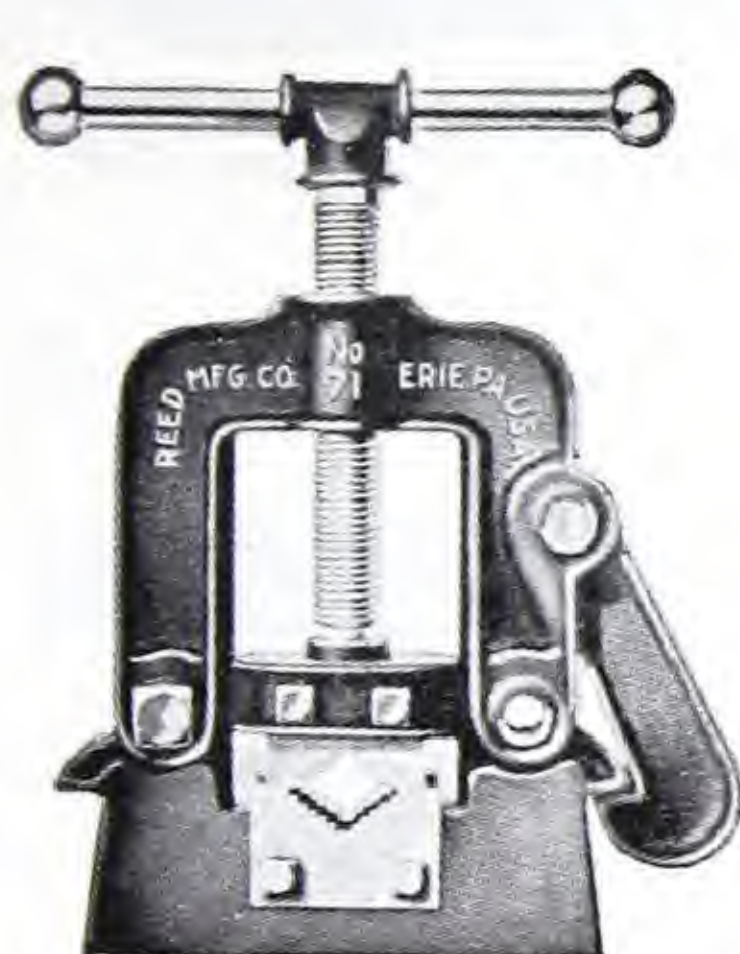
The operating screw is especially strong and serviceable, and has attached to it a heavy collar which protects it from wear caused by sliding pipe between the jaws or by opening jaws and letting pipe drop onto the screw.

The operating screw is furnished in two lengths: the Standard as shown in Fig. No. 1621, and the Long Shank as shown in Fig. No. 1622.

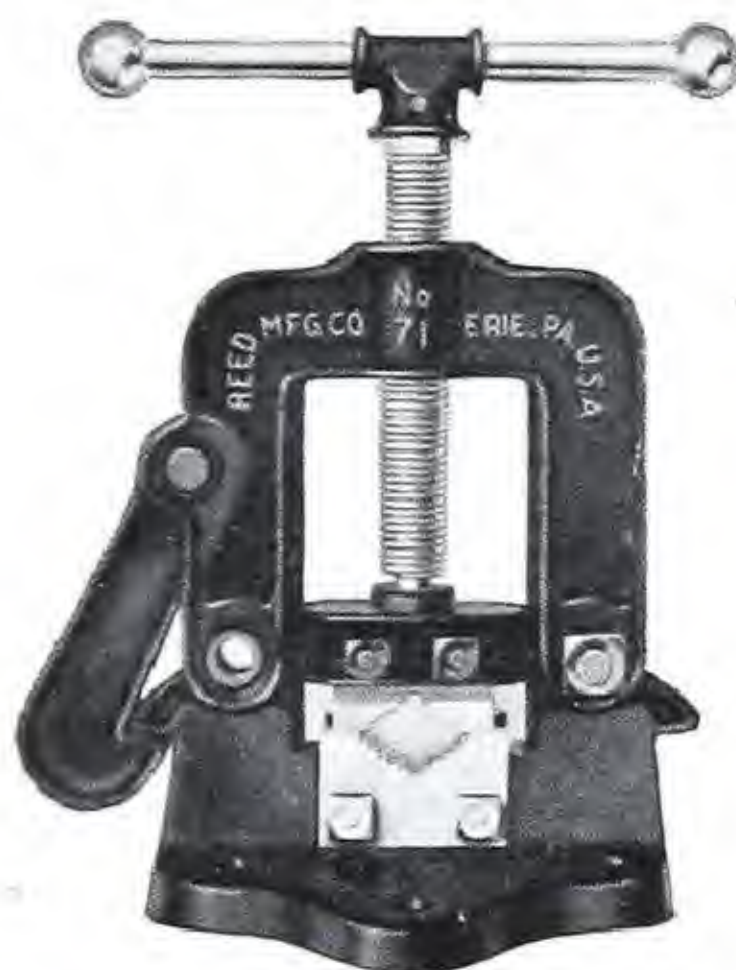
All parts of Grinnell Pipe Vises are interchangeable.

Order by Figure Number.

TOOLS

Reed Standard Pipe Vises

Front View



Rear View

Reed Standard Pipe Vise—Hinged Type
Fig. No. 1661

LIST PRICES

Vise Number	Price Each	Price, Jaws (3) per Set	Holds, Pipe Size, Inches	Vise, Weight Lbs.	Jaw, Weight per Set, lbs.
7000	\$2.50	\$1.20	$\frac{1}{8}$ to $1\frac{1}{4}$	3	$\frac{1}{2}$
700	3.60	1.50	$\frac{1}{8}$ to $1\frac{1}{2}$	5	$\frac{3}{4}$
70	4.25	1.80	$\frac{1}{8}$ to 2	$7\frac{1}{2}$	$1\frac{1}{4}$
71	5.00	1.80	$\frac{1}{8}$ to $2\frac{1}{2}$	10	$1\frac{3}{4}$
72	7.50	2.55	$\frac{1}{8}$ to $3\frac{1}{2}$	16	$3\frac{1}{4}$
73	11.00	3.60	$\frac{1}{8}$ to $4\frac{1}{2}$	25	$5\frac{1}{4}$

This vise is self-locking, guaranteed throughout.

Pipe Jaws are of fine tool steel, carefully tempered and tested.

Order by Figure and Vise Numbers.

TOOLS
Stillson Wrenches



Stillson Wrench, 6 to 14-inch, with Wood Handle—Fig. No. 1626



Stillson Wrench, 6 to 10-inch Style with Steel Handle—Fig. No. 1627

Stillson Wrench, 8 and 10-inch Automobile, Steel Handle (Not Ill.)—Fig. No. 1628



Stillson Wrench, 14 to 24-inch Style with Steel Handle—Fig. No. 1629



Stillson Wrench, 36 and 48-inch Style with Steel Handle—Fig. No. 1630

LIST PRICES

Length Open, Inches	6	8	10	14	18	24	36	48
Takes Pipe...Inches	$\frac{1}{8}$ to $\frac{1}{2}$	$\frac{1}{8}$ to $\frac{3}{4}$	$\frac{1}{8}$ to 1	$\frac{1}{4}$ to $1\frac{1}{2}$	$\frac{1}{4}$ to 2	$\frac{1}{4}$ to $2\frac{1}{2}$	$\frac{1}{4}$ to $3\frac{1}{2}$	1 to 5
Price.....Each	\$2.00	\$2.25	\$2.50	\$3.50	\$5.00	\$7.25	\$13.50	\$20.00

Unless otherwise specified, wrenches 10-inch and larger will always be furnished with steel handles.

Order by Size and Figure Number.

TOOLS

Stillson Wrench Parts

Steel Handle Bar, 6 to 10-inch
Fig. 1



Wood Handle Bar, 6 to 14-inch
Fig. 3



Automobile, 8 and 10-inch
Fig. 2



Steel Handle Bar, 14 to 24-inch
Fig. 4



Steel Handle Bar, 36 and 48-inch
Fig. 5



Jaw



Frame



Wood Handle



Nut

LIST PRICES

Size.....Inches	6	8	10	14	18	24	36	48
Bars with Springs Each	.95	1.00	1.10	1.50	2.25	3.50	7.00	10.50
Jaws.....Each	.75	.80	.85	1.15	1.75	2.25	4.35	7.50
Frames.....Each	.38	.42	.50	.60	.75	.95	1.70	2.20
Adjusting Nuts...Each	.12	.15	.20	.30	.35	.55	1.10	1.50
Wood Handles....Each	.16	.16	.18	.25	.....	.....	.....	.....
End Nuts.....Each	.15	.15	.20	.20	.....	.....	.....	.....
Frame Pins.....Each	.03	.03	.04	.04	.04	.04	.05	.05
Spring Rivets....Each	.01	.01	.02	.02	.02	.02	.02	.02
Springs.....Each	.10	.10	.10	.10	.10	.11	.13	.13

When ordering Parts, specify Size of Wrench.

TOOLS

Trimo Pipe Wrenches

LIST PRICES—Fig. No. 1631

Length.....Inches	6	8	10	14	18	24	36	48
Price.....Each	\$2.00	\$2.25	\$2.50	\$3.50	\$5.00	\$7.25	\$13.50	\$20.00

LIST PRICES OF PARTS

Size.....Inches	6	8	10	14	18	24	36	48
Movable Jaw.....Each	\$0.75	\$0.80	\$0.85	\$1.15	\$1.75	\$2.25	\$4.35	\$7.50
Nut.....Each	.12	.15	.20	.30	.35	.55	1.10	1.50
Insert Jaw.....Each	.35	.40	.50	.60	.70	.80	1.10	2.00
Frame.....Each	.40	.45	.55	.70	.95	1.40	2.20	2.70
Springs.....Each	.03	.03	.03	.03	.04	.04	.04	.04
Frame Pins.....Each	.03	.03	.04	.04	.04	.04	.05	.05
Jaw Pins.....Each	.03	.03	.04	.04	.04	.04	.05	.05
Steel Handle.....Each	.95	1.00	1.10	1.50	2.25	3.50	7.00	10.50
Wood Handles with Ferrule								
Each	.16	.16	.18	.25				
Nut Guards.....Per Pair	.15	.15	.20	.30	.35	.45	.55	.65

Monkey Wrenches

LIST PRICES—Fig. No. 1632

Length.....Inches	6	8	10	12	15	18	21
Price.....Per Dozen	\$15.00	\$18.00	\$22.00	\$28.00	\$38.00	\$48.00	\$58.00

Parmelee's Wrenches

LIST PRICES—Fig. No. 1633

Number.....	1	1	2	3	4
	Sleeve Lock	Nut Lock			
Takes Pipe Size.....Inches	$\frac{3}{8}$ to 1	$\frac{3}{8}$ to 1	1 to 2	2 to 3	3 and 4
Length.....Inches	10	10	20	20	37
Price Complete.....Each	\$9.00	\$8.50	\$15.00	\$17.00	\$52.00
Price Wrench without Girths					
Each	3.50	2.75	6.00	7.00	21.00

Order by Figure Number.

TOOLS

Williams "Falcon" Chain Pipe Wrench
Drop Forged

With Flat Link Chain—Fig. No. 1634



With Cable Chain—Fig. No. 1635

LIST PRICES

Size Number	41	42	43	43½	44	45
Fits Pipe or Fitting Size Inches	1/8 to 1½	1/4 to 2½	3/4 to 4	1 to 6	1½ to 8	2 to 12
Price Complete	\$7.00	\$10.00	\$14.00	\$18.00	\$22.00	\$36.00
Price Extra Chain	2.00	3.00	5.00	7.00	9.00	15.00
Price Extra Jaws	3.50	5.50	8.00	9.50	11.00	15.00
Extreme Length Inches	20	27	37	44½	50½	64½
Approx. Weight Pounds	5	10	15	23	31	53
Length Flat Link Chain	14½	19	26	33	42½	57½
Length Cable Chain	15	19	28	36	43½	58½

The Falcon Chain Tong is unsurpassed for use in cramped quarters and on fittings. The removable jaw is reversible, end for end, as teeth first in use wear and is tempered for file re-sharpening. All parts are interchangeable.

Order by Figure and Size Numbers.

TOOLS

Williams "Vulcan" Chain Pipe Wrenches

Drop Forged



With Flat Link Chain—Fig. No. 1636



With Cable Chain—Fig. No. 1637

LIST PRICES

Size Number	10	11	12	13	13½	14	15	16
Size Pipe Inches	1/8 to 3/4	1/8 to 1½	1/4 to 2½	3/4 to 4	1 to 6	1½ to 8	2 to 12	4 to 18
Price Complete	\$5.00	\$7.00	\$10.00	\$14.00	\$18.00	\$22.00	\$36.00	\$80.00
Price Extra Chain	1.50	2.00	3.00	5.00	7.00	9.00	15.00	40.00
Price Extra Jaws	2.00	3.50	5.50	8.00	9.50	11.00	15.00	32.00
Extra Bolt and Nut	.28	.36	.46	.60	.70	.90	1.30	2.50
Extreme Length Inches	13¾	20	27	37	44½	50½	64½	87
Approx. Weight Pounds	1¾	5¾	10	16	24	31	50	137
Length Flat Link Chain	9½	13½	17½	22½	32	40½	55½	74½
Length Cable Chain	9¾	14½	18	27	33½	42	57	76

Order by Figure and Size Numbers.

TOOLS

Four Point Star Drills

Fig. No. 125

LIST PRICES—Fig. No. 125

Diameter	Length			
	8"	12"	18"	24"
$\frac{1}{4}$	\$ 8.25	\$8.50	\$11.00	\$13.50
$\frac{5}{16}$	8.25	8.50	11.00	13.50
$\frac{3}{8}$	8.25	8.50	11.00	13.50
$\frac{7}{16}$	8.70	9.00	11.50	14.00
$\frac{1}{2}$	9.65	10.00	12.50	15.00
$\frac{5}{8}$	11.65	12.00	15.00	17.50
$\frac{3}{4}$	13.70	14.00	17.50	20.00
$\frac{7}{8}$	15.30	16.00	20.00	22.50
1	17.00	18.00	22.50	25.00
$1\frac{1}{8}$	.....	24.00	28.00	32.00
$1\frac{1}{4}$	.....	30.00	35.00	40.00
$1\frac{3}{8}$	.....	40.00	45.00	50.00
$1\frac{1}{2}$	.....	50.00	56.00	62.00
$1\frac{5}{8}$	.....	60.00	66.00	72.00
$1\frac{3}{4}$	.....	75.00	81.00	87.00
$1\frac{7}{8}$	.....	90.00	97.00	104.00
2	.....	105.00	112.00	120.00

Steel Star Drills are manufactured from high carbon tool steel and have four points. Used extensively for drilling holes in concrete, brick, stone or tile walls, ceilings and floors. Carefully and uniformly made, they are guaranteed against imperfection.

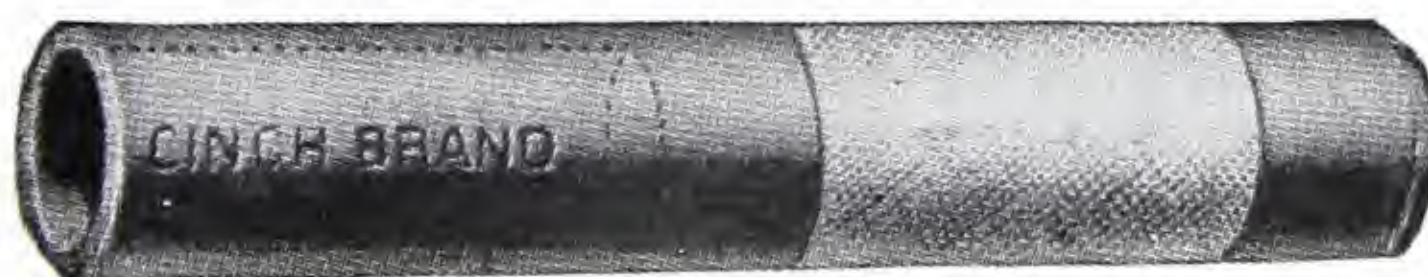
Cinch Caulking Tools

Fig. No. 23

LIST PRICES—Fig. No. 23

Diameter of Bolt...Inches	$\frac{3}{16}$	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1
Price..... Each	\$1.50	1.75	2.00	2.25	2.50	3.00	5.50	6.75	7.50	12.00

Cinch Caulking Tools are used to expand Cinch Anchor units shown on page 465. Prices on larger sizes furnished on application. Order by Figure Number.

TOOLS

Vanderman's Steel Tool Chests

Style A
With One or Two Drawers

LIST PRICES—Style A with One Drawer—Fig. No. 1638

Size Number	Price Each	Depth Inches	Width Inches	Length Inches
1	\$26.00	11	12	24
2	35.50	14	15	30
3	39.00	16	17	36
4	45.50	19	20	42
5	51.00	20	22	48

LIST PRICES—Style A with Two Drawers—Fig. No. 1639

Size Number	Price Each	Depth Inches	Width Inches	Length Inches
1	\$30.00	11	12	24
2	39.00	14	15	30
3	42.00	16	17	36
4	47.00	19	20	42
5	55.00	20	22	48

Style A will be shipped with one drawer unless otherwise specified.

Made from 1/16-inch cold rolled sheet steel with malleable iron corner pieces and hardwood braces, and fitted with heavy wrought iron hinges and hasp, with cover so arranged as to be held open by support from the back of chest. Each chest is furnished with a brass lock and two keys, and bolts to screw down at front corners. They are painted, well proportioned and ornamental in design.

Chests can also be furnished in other styles and sizes. Prices on application.

Order by Figure and Size Numbers.

TOOLS

*Fields Compound**For Pipe Joints*

Fig. No. 1640

A correct combination of quality leads, oils and other ingredients making an excellent lubricant for Screwed Pipe Joints.

Fields Pipe Joint Compound has been constantly and successfully used for many years by large pipe erecting forces throughout Canada.

LIST PRICES

Price, 5 pound cans	Each \$1.50
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Quantity prices on application.

Order by Figure Number.

TOOLS

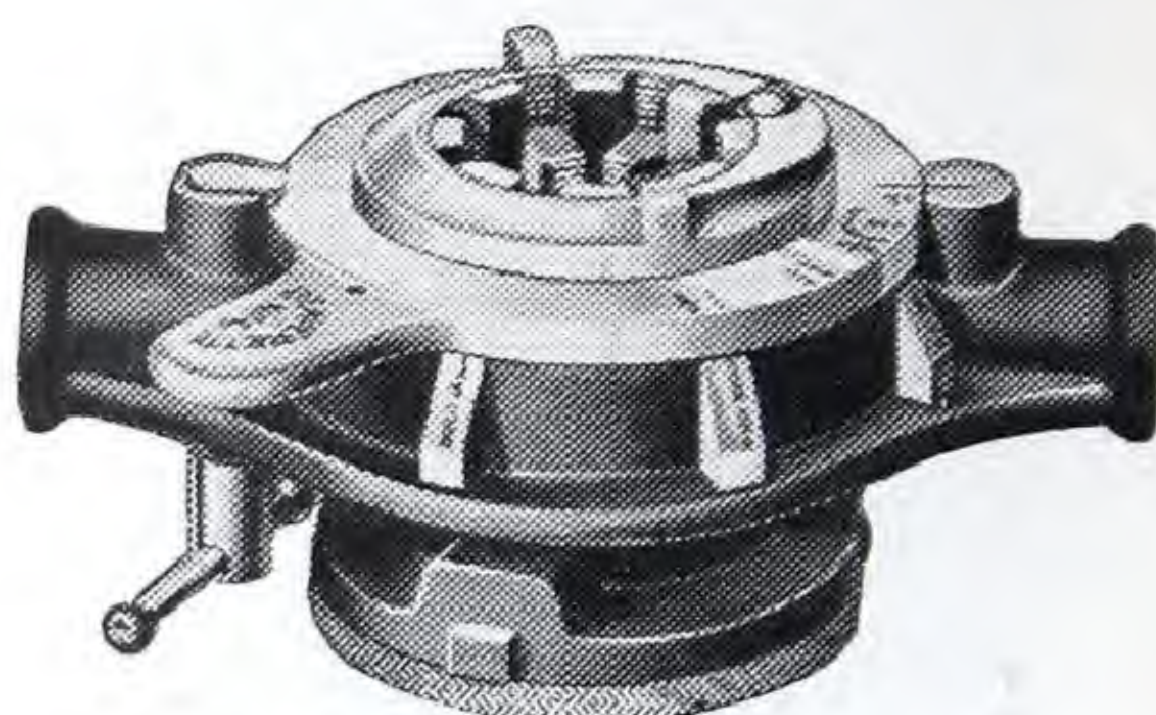
Beaver Pipe Threading Machines

Fig. No. 6—Beaverette
Threads $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$ and $\frac{3}{4}$ -inch Pipe
without changing Dies or Bushings.

LIST PRICES

Figure Numbers	Threads Pipe Sizes	Price Complete	Price for Set of Dies
*6	$\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$ or $\frac{3}{4}$	\$15.00	\$3.00
†6½	$\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$ or 1	15.00	3.00
‡7	$\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$ or 1	15.00	3.00

*The Fig. No. 6 is the regular tool furnished to cut American Briggs Standard, or Whitworth Pipe Standard for export.

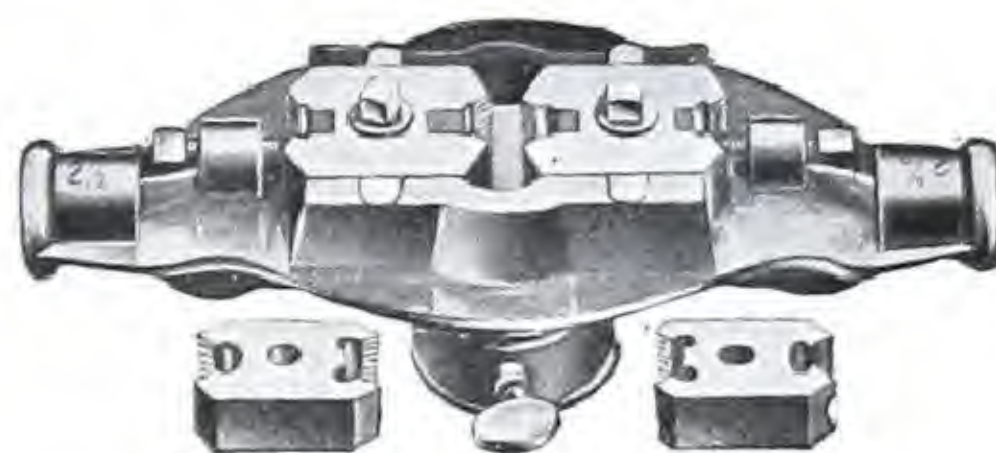
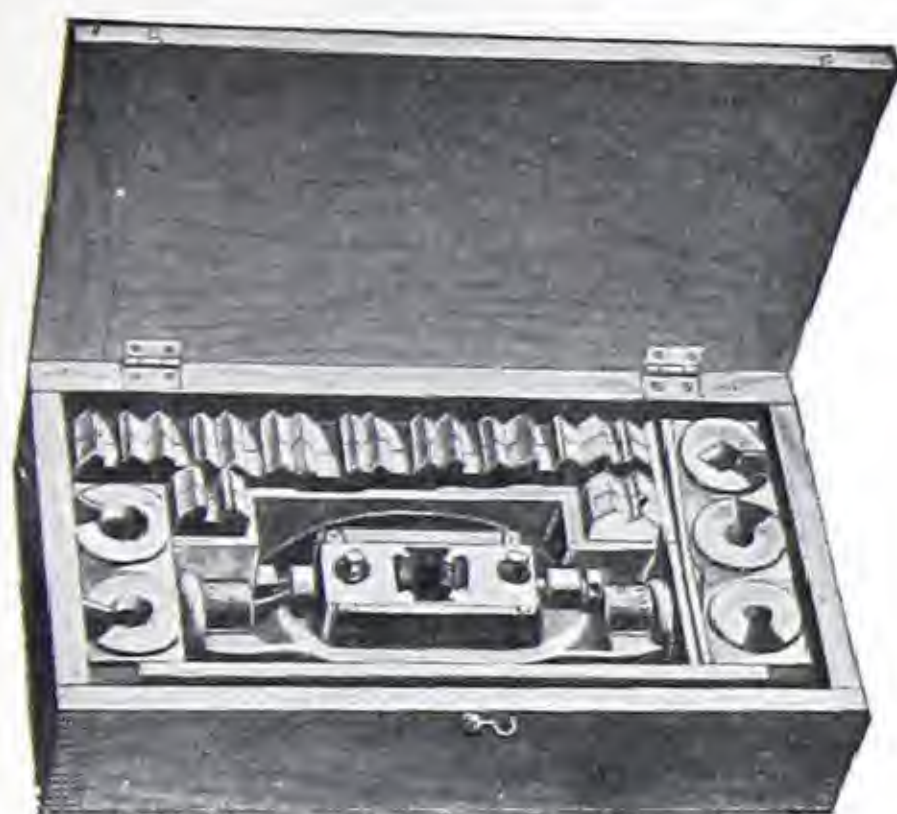
†The Fig. No. 6½ is for fine thread brass tubing only, as used in certain sections of U. S. A.

‡The Fig. No. 7 is for export only for English electrical conduit. Sizes $\frac{1}{2}$ to 1-inch outside diameter.

The Fig. No. 6 is the response to the demand of the trade for a small-sized Beaver without die change. The dies are adjustable to cut threads on $\frac{1}{4}$ to $\frac{3}{4}$ -inch pipe either standard, undersize or oversize. Separate dies can be furnished to cut left hand threads.

Order by Figure Number.

TOOLS

Armstrong Adjustable Die Stocks

LIST PRICES—Fig. No. 1646

Size Number	Thread Pipe Size Inches	Price Com- plete Each	Stock Only Each	*Extra Dies Per Set	Extra Bush- ings Each	Extra Wren- ches Each
No. 1 R. H. (4 dies)...Each	$\frac{1}{8}$ to $\frac{1}{2}$	\$9.00	\$3.25	\$1.60	\$0.30	\$0.20
No. 2 R. H. (5 dies)...Each	$\frac{1}{4}$ to 1	12.00	4.00	2.00	.40	.25
No. 2½ R. H. (4 dies).Each	$\frac{1}{2}$ to 1¼	14.00	5.25	3.50	.60	.25
No. 3 R. H. (3 dies)...Each	1¼ to 2	18.00	7.00	4.50	.75	.30
No. 6 R. H. (2 dies)...Each	2½ & 3	45.00	25.00	17.00	2.00	.30
No. 7 R. H. (4 dies)...Each	2½ to 4	75.00	30.00	20.00	3.00	.30

LIST PRICES ON PARTS

Size Number	1	2	2½	3	6	7
Collar Screws.....Each	.25	.30	.35	.50	.50	.50
Adjusting Screws.....Each	.20	.25	.35	.40	.40	.40
Thumb Screws.....Each	.20	.30	.30	.50	.....	.....
Handles.....Per Set	.75	1.25	1.25	2.50	7.00	7.00

*Price is for set of Dies, two pieces, except No. 7, which covers four pieces. Numbers 1, 2 and 3 have Single End Dies. Numbers 2½ and 6 have Double End Dies. Number 7 has eight Double End Dies; four per set. Numbers 6 and 7 have four arms.

Order by Figure and Size Numbers.

TOOLS

Pipe Taps and Reamers
American Standard Pipe Threads



Pipe Tap
Fig. No. 1647



Pipe Reamer
Fig. No. 1649



Combined Drill and Tap
Fig. No. 1650

LIST PRICES—Fig. Nos. 1647, 1649

Size. Inches	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$
Price Each	\$1.00	\$1.20	\$1.60	\$2.00	\$2.80	\$4.40	\$5.00
Number of Threads. . . Per Inch	27	18	18	14	14	$11\frac{1}{2}$	$11\frac{1}{2}$
Length of Thread Inches	$\frac{3}{4}$	$1\frac{1}{16}$	$1\frac{1}{16}$	$1\frac{3}{8}$	$1\frac{3}{8}$	$1\frac{3}{4}$	$1\frac{3}{4}$
Length Overall Inches	$2\frac{1}{8}$	$2\frac{7}{16}$	$2\frac{9}{16}$	$3\frac{1}{8}$	$3\frac{1}{4}$	$3\frac{3}{4}$	4

Size. Inches	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	....
Price Each	6.60	10.00	15.00	22.50	30.00	45.00	....
Number of Threads. . . Per Inch	$11\frac{1}{2}$	$11\frac{1}{2}$	8	8	8	8	....
Length of Thread Inches	$1\frac{3}{4}$	$1\frac{3}{4}$	$2\frac{9}{16}$	$2\frac{5}{8}$	$2\frac{11}{16}$	$2\frac{3}{4}$	....
Length Overall Inches	$4\frac{1}{4}$	$4\frac{1}{2}$	$5\frac{1}{2}$	6	$6\frac{1}{2}$	$6\frac{3}{4}$	....

Left hand taps same list prices as above.

LIST PRICES—Fig. No. 1650

Size. Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$
Price Each	\$2.50	\$3.00	\$3.75	\$5.00

Size Inches	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Price Each	6.25	7.50	9.25	12.00

LIST PRICES—Plug Taps (Not illustrated) Fig. No. 1648

Size Inches	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$
Price Each	\$1.00	\$1.20	\$1.60	\$2.00	\$2.80

Size. Inches	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	....
Price. Each	\$4.40	\$5.00	\$6.60	\$10.00	....

Plug Taps are used for tapping out Lock-nuts or straight fittings. Outside diameters are $\frac{1}{64}$ -inch less than actual external diameter of wrought iron steam or gas pipe.

Order by Figure Number.

TOOLS

Trimo Pipe Cutters

LIST PRICES—Fig. No. 1651

Size.....	Number	1	2	3
Cuts Pipe Size.....	Inches	$\frac{1}{8}$ to $1\frac{1}{4}$	$\frac{1}{4}$ to 2	1 to 3
Price.....	Each	\$4.50	\$6.00	\$10.00
Extra Wheels, Knife Edge.....	Each	.40	.40	.50
Extra Wheels, Knurled Edge.....	Each	.60	.60	.90
Extra Rolls.....	Each	.30	.30	.40
Extra Pins with Cotter Pins.....	Per Doz.	1.30	1.30	1.30
Extra Anti-Friction Washers.....	Per Doz.	.60	.60	.60
Extra Fork Block Carriers.....	Each	.10	.10	.10
Extra Roll Blocks.....	Each	1.25	1.25	2.25
Extra Frames.....	Each	2.25	2.50	3.25
Extra Handle Screws.....	Each	1.00	1.25	2.00
Extra Handles.....	Each	.50	.50	.50
Extra Roll Block Pin.....	Each	.03	.03	.03

Barnes Three-Wheel Pipe Cutters

Size Nos. 1 and 2



Size Nos. 3 to 7

LIST PRICES—Fig. No. 1652

Size.....	Number	1	2	3	4	5	6	7
Cuts Pipe Size.....	Inches	$\frac{1}{8}$ to 1	$\frac{1}{2}$ to 2	$1\frac{1}{2}$ to 3	$2\frac{1}{2}$ to 4	4 to 6	6 to 8	9 to 12
Price.....	Each	\$4.50	\$6.00	\$10.00	\$20.00	\$30.00	\$40.00	\$50.00
Extra Wheels.....	Each	.25	.30	.40	.50	.75	.75	.75
Extra Pins.....	Per Doz.	1.00	1.00	1.00	2.00	2.00	2.00	2.00

Order by Figure and Size Numbers.

TOOLS

*Reed Improved Pipe Cutters**Saunders or Roller Type*

Fig. No. 1662

LIST PRICES

Size.....Number	1S	2S	3S	4S	5S
Cuts Pipe, Size.....Inches	$\frac{1}{8}$ to 1	1 to 2	2 to 3	$2\frac{1}{2}$ to 4	4 to 6
Price.....Each	\$3.00	\$4.50	\$11.00	\$18.00	\$28.00
Extra Wheels.....Per Dozen	2.88	3.84	7.20	7.20	7.20
Extra Rollers.....Per Dozen	2.88	3.84	6.00	6.00	7.20
Extra Pins.....Per Dozen	1.20	1.20	1.80	1.80	1.80
Blocks and Wheels.....Each	1.25	1.75	2.75	3.50	4.00
Handle and Screw.....Each	1.00	1.25	1.75	3.50	5.00

This is a roller type cutter with a single cutter wheel. It is suited only to work where the cutter can be revolved entirely around the pipe.

Each Reed Pipe Cutter is regularly supplied with a Reed knife blade wheel.

Order by Figure and Size Number.

TOOLS

Asbestos Lead Joint Runners

With Spring Clamp

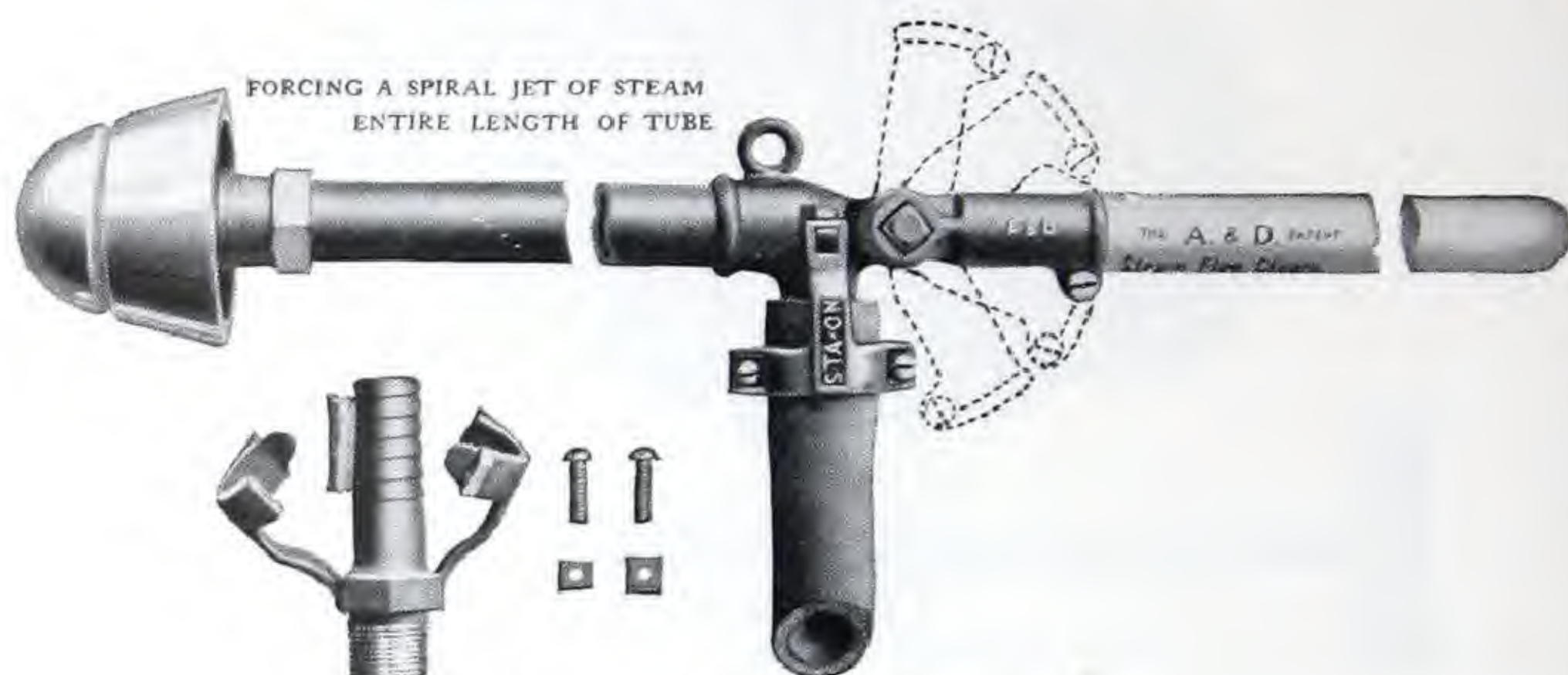
Fig. No. 1653

LIST PRICES

Size Number	Price Each	Size of Joint Runner Inches	For Use on Pipe Size—Inches
1	\$2.15	$\frac{3}{4}$ sq.	2 to 4
2	2.35	$\frac{3}{4}$ sq.	4 to 6
3	4.15	1 sq.	6 to 10
4	5.40	1 sq.	10 to 14
5	11.00	$1\frac{1}{4}$ sq.	16 to 20
6	12.25	$1\frac{1}{4}$ sq.	24
7	13.95	$1\frac{1}{4}$ sq.	30
8	15.75	$1\frac{1}{4}$ sq.	36
9	17.65	$1\frac{1}{4}$ sq.	42
10	18.80	$1\frac{1}{4}$ sq.	48

In addition to the above, we can furnish other necessary tools required for the installation of underground socket piping such as lead furnaces, lead, pots, ladles, etc. Prices on application.
Order by Figure and Size Numbers.

TOOLS

Tube Cleaners — Tube Expanders

"A & D" Steam Tube Cleaner
Fig. No. 1655

LIST PRICES

Size.....	Number	1	2	3	4	*5
For Tubes Size.....	Inches	1-1½"	1¾-2½"	2¾-3½"	3½-4"	4½-8"
Price Cleaner with Clamps and Nipple.....	Each	\$7.00	\$8.00	\$9.00	\$10.00	\$12.00
Price Extra Heads.....	Each	4.66	5.34	6.00	6.66	8.00

*No. 5 has Malleable Iron Head. Nos. 1 to 4 have Brass Heads.



Henderer Roller Tube Expander
Fig. No. 1656

Size.....	Inches	1	1¼	1½	1¾	2	2¼	2½
Price Complete.....	Each	\$10.00	\$10.00	\$10.00	\$10.00	\$10.00	\$12.00	\$14.00
Price Mandrils.....	Each	1.00	1.50	2.00	2.00	2.50	3.00	3.50
*Price Rolls, per set.....		.50	.60	.70	.80	1.00	1.15	1.30

Size.....	Inches	2¾	3	3¼	3½	3¾	4	.....
Price Complete.....	Each	\$16.00	\$18.00	\$20.00	\$23.00	\$25.00	\$30.00	.....
Price Mandrils.....	Each	3.50	4.00	4.50	5.00	5.75	6.50	.....
*Price Rolls, per set.....		1.45	1.60	1.75	2.00	2.25	2.50	.....

Three Rolls Per Set.

In addition to types shown above we can furnish other standard makes and types to suit particular conditions or requirements.

Order by Size and Figure Numbers.

TOOLS

Tube Cleaners and Brushes

Ingalls' Tube Cleaner, Plain
Fig. No. 1657



Ingalls' Tube Cleaner with Brush
Fig. No. 1658

LIST PRICES—Fig. Nos. 1657, 1658

Size.....Inches	2	2¼	2½	2¾
Fig. No. 1657.....Each	\$2.00	\$2.25	\$2.50	\$2.75
Fig. No. 1658.....Each	2.50	2.85	3.15	3.45
Size.....Inches	3	3¼	3½	4
Fig. No. 1657.....Each	\$3.00	\$3.25	\$3.50	\$4.00
Fig. No. 1658.....Each	3.75	4.05	4.40	5.00



Steel Wire Tube Cleaner
Sizes 1 1/2 to 6-inches
Fig. No. 1659



Spiral Wire Flue Brush
Sizes 1 to 6-inches
Fig. No. 1660

LIST PRICES—Fig. Nos. 1659, 1660

Diameter of Brush.....Inches	1	1¼	1½	2	2¼	2½
Price.....Each	\$1.00	\$1.25	\$1.50	\$2.00	\$2.25	\$2.50
Diameter of Brush.....Inches	3	3¼	3½	4	5	6
Price.....Each	\$3.00	\$3.25	\$3.50	\$4.00	\$5.00	\$6.00

Sizes 1 and 1¼-inch made to order.
Order by Figure and Size Numbers.

MISCELLANEOUS DATA

*Wrought Pipe**Steel or Iron**Hydrostatic Pressure for Welded Pipe*

Standards for Mill Tests on Wrought Pipe to detect defects in welds average as follows: Pressure expressed in pounds per square inch.

STANDARD BUTT WELDED WROUGHT PIPE

The tests on $\frac{1}{8}$ to 3-inch, inclusive, range from 700 to 1,000 pounds, according to size.

STANDARD LAP WELDED WROUGHT PIPE

The tests on $1\frac{1}{2}$ to 12-inch, inclusive, range from 500 to 1,000 pounds, according to size.

EXTRA STRONG BUTT WELDED WROUGHT PIPE

The tests on $\frac{1}{8}$ to 3-inch, inclusive, range from 700 to 1,500 pounds, according to size.

EXTRA STRONG LAP WELDED WROUGHT PIPE

The tests on $1\frac{1}{2}$ to 12-inch, inclusive, range from 1,100 to 2,500 pounds, according to size.

DOUBLE EXTRA STRONG BUTT WELDED WROUGHT PIPE

The tests on $\frac{1}{8}$ to 3-inch, inclusive, range from 700 to 2,200 pounds, according to size.

DOUBLE EXTRA STRONG LAP WELDED WROUGHT PIPE

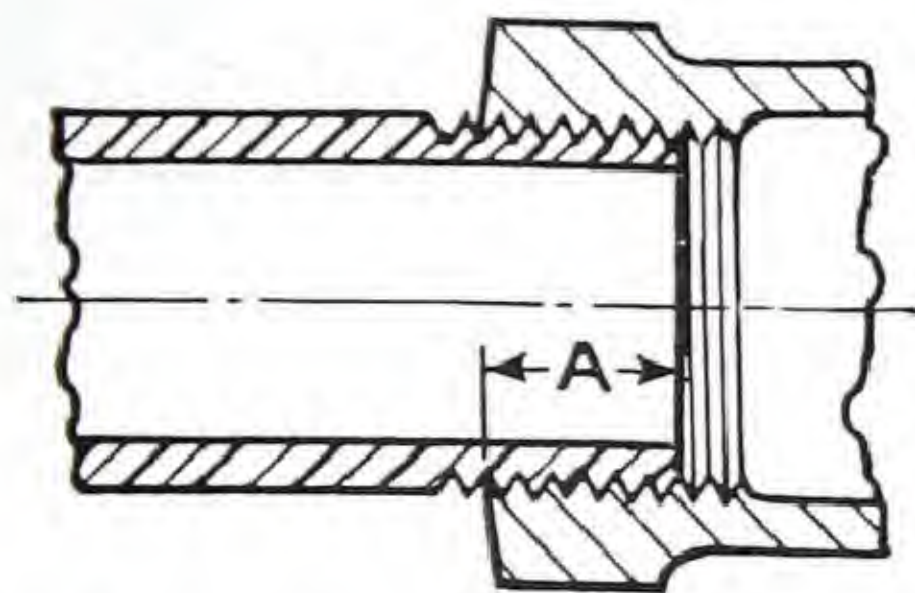
The tests on $1\frac{1}{2}$ to 8-inch, inclusive, range from 2,000 to 3,000 pounds, according to size.

Standard Bundling Schedule

AVERAGE NUMBER OF FEET AND WEIGHT PER BUNDLE

Size	Standard Pipe			Extra Strong Pipe			D'bleExtraStrongPipe		
	Pieces	Feet	Weight	Pieces	Feet	Weight	Pieces	Feet	Weight
$\frac{1}{8}$	.....	500	123	.....	500	157	.....	.....	.....
$\frac{1}{4}$	24	420	179	24	400	214	.....	.....	.....
$\frac{3}{8}$	18	340	193	18	330	244	.....	.....	.....
$\frac{1}{2}$	12	240	204	12	230	250	7	130	223
$\frac{3}{4}$	7	140	159	7	140	206	5	95	232
1	5	100	168	5	100	217	3	60	220
$1\frac{1}{4}$	3	60	137	3	60	180	3	60	313
$1\frac{1}{2}$	3	60	164	3	60	218	3	60	384

MISCELLANEOUS DATA

Length of Thread on Pipe

Length of Thread Screwed into Valves or Fittings

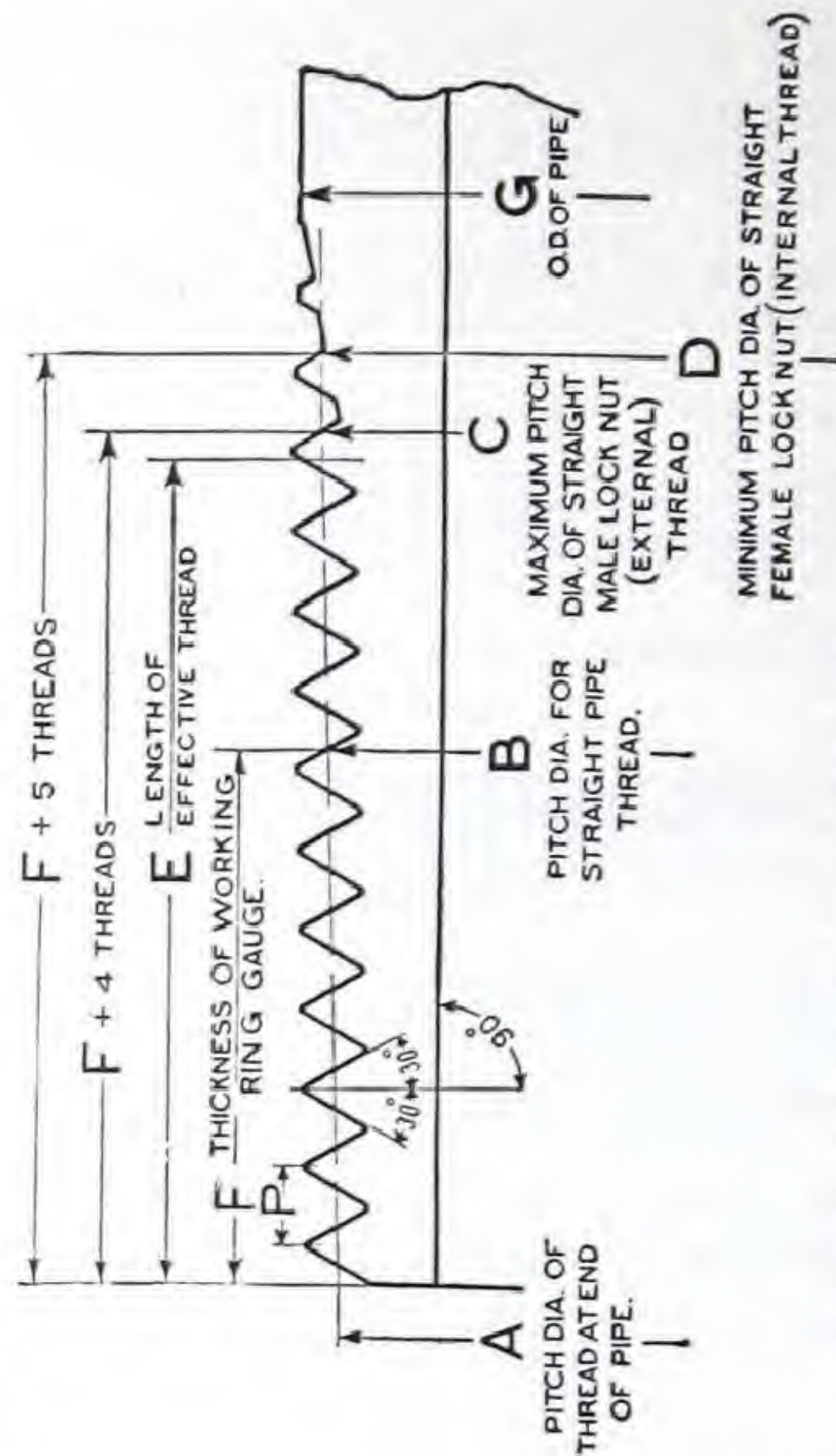
Size Inches	Dimension A Inches	Size Inches	Dimension A Inches
$\frac{1}{8}$	$\frac{1}{4}$	$3\frac{1}{2}$	$1\frac{1}{16}$
$\frac{1}{4}$	$\frac{3}{8}$	4	$1\frac{1}{16}$
$\frac{3}{8}$	$\frac{3}{8}$	$4\frac{1}{2}$	$1\frac{1}{8}$
$\frac{1}{2}$	$\frac{1}{2}$	5	$1\frac{3}{16}$
$\frac{3}{4}$	$\frac{1}{2}$	6	$1\frac{1}{4}$
1	$\frac{9}{16}$	7	$1\frac{1}{4}$
$1\frac{1}{4}$	$\frac{5}{8}$	8	$1\frac{5}{16}$
$1\frac{1}{2}$	$\frac{5}{8}$	9	$1\frac{3}{8}$
2	$\frac{11}{16}$	10	$1\frac{1}{2}$
$2\frac{1}{2}$	$\frac{15}{16}$	12	$1\frac{5}{8}$
3	1	....	....

Dimensions given do not allow for variation in tapping or threading.

MISCELLANEOUS DATA

American Standard

For Taper and Straight Pipe Threads and Locknut Threads

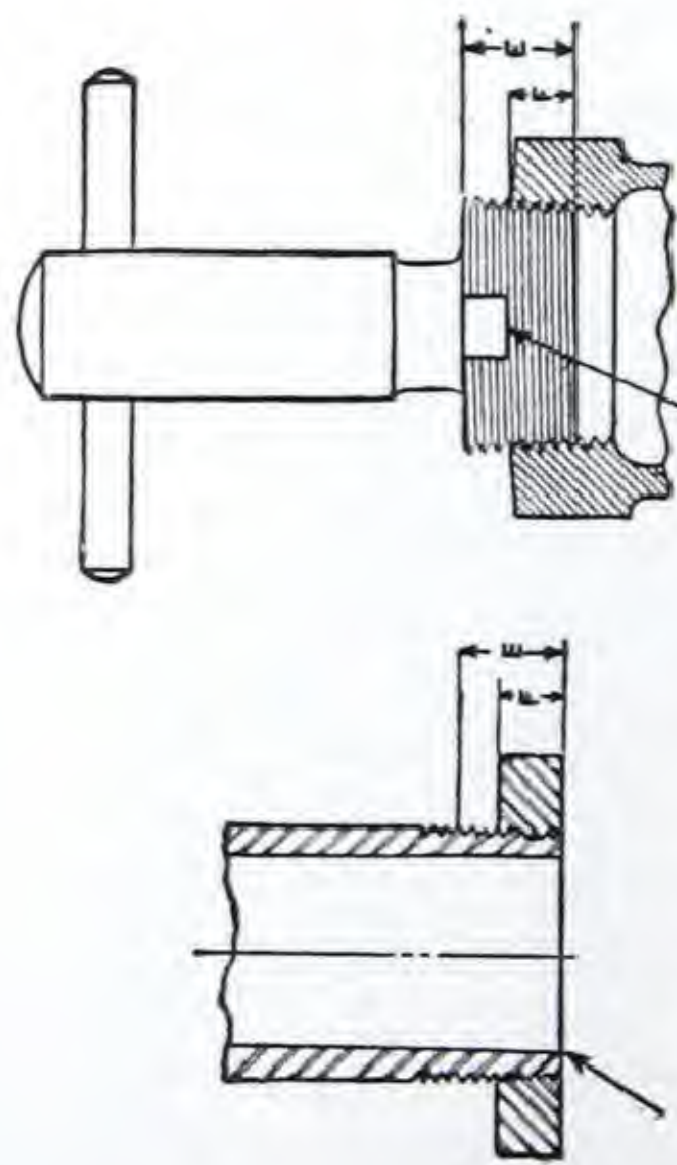


TOLERANCE FOR MALE THREADS:

One Turn Large (max. size), One Turn Small (min. size), from face of Ring Gauge.

TOLERANCE FOR FEMALE THREADS:

One Turn Large (max. size), One Turn Small (min. size), from Gauging Notch.



GAUGE TO GO ON FLUSH BY HAND

PLUG GAUGE TO GO IN UNTIL NOTCH IS FLUSH WITH END OF THREADS.

A equals $G - (0.05G + 1.1)P$

B equals $A + .0625F$

C equals $B + (4P \times .0625)$

D equals $B + (5P \times .0625)$

E equals $(0.8G + 6.8)P$

F equals thickness of Working Ring Gauge.

P equals Pitch

Total Taper $\frac{3}{4}$ -inch per foot.

Depth of Thread $0.8P$.

MISCELLANEOUS DATA

American Standard

For Taper and Straight Pipe Threads and Locknut Threads

(Continued)

Size	A	B	C	D	E	F	G	Depth of Thread	Pitch of Thread	Threads per inch
$\frac{1}{8}$	.36351	.37476	.38402	.38633	.2638	.180	.405	.02963	.03704	27
$\frac{1}{4}$	.47739	.48989	.50378	.50725	.4018	.200	.540	.04444	.05556	18
$\frac{3}{8}$	.61201	.62701	.64090	.64437	.4078	.240	.675	.04444	.05556	18
$\frac{1}{2}$	.75843	.77843	.79628	.80075	.5337	.320	.840	.05714	.07143	14
$\frac{3}{4}$	.96768	.98886	1.00672	1.01118	.5457	.339	1.050	.05714	.07143	14
1	1.21363	1.23863	1.26037	1.26580	.6828	.400	1.315	.06956	.08696	$11\frac{1}{2}$
$1\frac{1}{4}$	1.55713	1.58338	1.60512	1.61055	.7068	.420	1.660	.06956	.08696	$11\frac{1}{2}$
$1\frac{1}{2}$	1.79609	1.82234	1.84407	1.84951	.7235	.420	1.900	.06956	.08696	$11\frac{1}{2}$
2	2.26902	2.29627	2.31801	2.32344	.7565	.436	2.375	.06956	.08696	$11\frac{1}{2}$
$2\frac{1}{2}$	2.71953	2.76216	2.79341	2.80122	1.1375	.682	2.875	.100	.12500	8
3	3.34063	3.38850	3.41975	3.42756	1.2000	.766	3.500	.100	.12500	8
$3\frac{1}{2}$	3.83750	3.88881	3.92006	3.92787	1.2500	.821	4.000	.100	.12500	8
4	4.33438	4.38713	4.41838	4.42619	1.3000	.844	4.500	.100	.12500	8
$4\frac{1}{2}$	4.83125	4.88594	4.91719	4.92500	1.3500	.875	5.000	.100	.12500	8
5	5.39073	5.44929	5.48054	5.48836	1.4063	.937	5.563	.100	.12500	8
6	6.44609	6.50597	6.53722	6.54503	1.5125	.958	6.625	.100	.12500	8
7	7.43984	7.50234	7.53359	7.54141	1.6125	1.000	7.625	.100	.12500	8
8	8.43359	8.50003	8.53128	8.53909	1.7125	1.063	8.625	.100	.12500	8
9	9.42734	9.49797	9.52922	9.53703	1.8125	1.130	9.625	.100	.12500	8
10	10.54531	10.62094	10.65219	10.66000	1.9250	1.210	10.750	.100	.12500	8
11	11.53906	11.61938	11.65063	11.65844	2.0250	1.285	11.750	.100	.12500	8
12	12.53281	12.61781	12.64906	12.65688	2.1250	1.360	12.750	.100	.12500	8
14 O.D.	13.77500	13.87262	13.90387	13.91168	2.250	1.562	14.00	.100	.12500	8
15 O.D.	14.76875	14.87419	14.90543	14.91324	2.350	1.687	15.00	.100	.12500	8
16 O.D.	15.76250	15.87575	15.90700	15.91481	2.450	1.812	16.00	.100	.12500	8
17 O.D.	15.75625	16.87500	16.90625	16.91406	2.550	1.900	17.00	.100	.12500	8
18 O.D.	17.75000	17.87500	17.90625	17.91406	2.650	2.000	18.00	.100	.12500	8
20 O.D.	19.73750	19.87031	19.90156	19.90937	2.850	2.125	20.00	.100	.12500	8
22 O.D.	21.72500	21.86562	21.89687	21.90468	3.050	2.250	22.00	.100	.12500	8
24 O.D.	23.71250	23.86094	23.89218	23.89999	3.250	2.375	24.00	.100	.12500	8

MISCELLANEOUS DATA

Standard Wrought Iron and Steel Pipe

DIMENSIONS

Pipe Size	External Diameter	Internal Diameter	Thickness	Length of Pipe per Sq. Feet of External Surface in Feet	Length of Pipe per Sq. Feet of Internal Surface in Feet
$\frac{1}{8}$	.405	.269	.068	9.431	14.199
$\frac{1}{4}$	.540	.364	.088	7.073	10.493
$\frac{3}{8}$	.675	.493	.091	5.658	7.747
$\frac{1}{2}$	.840	.622	.109	4.547	6.141
$\frac{3}{4}$	1.050	.824	.113	3.637	4.635
1	1.315	1.049	.133	2.904	3.641
$1\frac{1}{4}$	1.660	1.380	.140	2.301	2.767
$1\frac{1}{2}$	1.900	1.610	.145	2.010	2.372
2	2.375	2.067	.154	1.608	1.847
$2\frac{1}{2}$	2.875	2.469	.203	1.328	1.547
3	3.500	3.068	.216	1.091	1.245
$3\frac{1}{2}$	4.000	3.548	.226	.954	1.076
4	4.500	4.026	.237	.848	.948
$4\frac{1}{2}$	5.000	4.506	.247	.763	.847
5	5.563	5.047	.258	.686	.756
6	6.625	6.065	.280	.576	.629
7	7.625	7.023	.301	.500	.543
8	8.625	8.071	.277	.442	.473
8	8.625	7.981	.322	.442	.478
9	9.625	8.941	.342	.396	.427
10	10.750	10.192	.279	.355	.374
10	10.750	10.136	.307	.355	.376
10	10.750	10.020	.365	.355	.381
11	11.750	11.000	.375	.325	.347
12	12.750	12.090	.330	.299	.315
12	12.750	12.000	.375	.299	.318

Above information is quoted from standard authorities. Not guaranteed.

MISCELLANEOUS DATA

*Standard Wrought Iron and Steel Pipe**One Foot in Length With Threads and Couplings*

DIMENSIONS, CAPACITY AND WEIGHT

Pipe Size	Internal Diameter	Internal Area Sq. In.	Capacity in U. S. Gallons	Weight of Water	Weight of Pipe	Weight of Water and Pipe
$\frac{1}{8}$	.269	.0569	.00296	.0247	.245	.270
$\frac{1}{4}$	.364	.104	.00540	.0450	.425	.470
$\frac{3}{8}$	.493	.191	.00992	.0826	.568	.651
$\frac{1}{2}$	.622	.304	.0158	.132	.852	.984
$\frac{3}{4}$	.824	.532	.0276	.230	1.134	1.364
1	1.049	.865	.0449	.374	1.684	2.058
$1\frac{1}{4}$	1.380	1.49	.0774	.645	2.281	2.926
$1\frac{1}{2}$	1.610	2.04	.106	.883	2.731	3.614
2	2.067	3.35	.174	1.45	3.678	5.128
$2\frac{1}{2}$	2.469	4.78	.248	2.07	5.819	7.889
3	3.068	7.37	.383	3.19	7.616	10.806
$3\frac{1}{2}$	3.548	9.88	.513	4.28	9.202	13.482
4	4.026	12.7	.660	5.50	10.889	16.389
$4\frac{1}{2}$	4.506	15.9	.826	6.88	12.642	19.522
5	5.047	20.0	1.04	8.66	14.810	23.470
6	6.065	28.8	1.50	12.5	19.185	31.685
7	7.023	38.7	2.01	16.8	23.769	40.569
8	8.071	51.1	2.66	22.2	25.000	47.200
8	7.981	50.0	2.60	21.7	28.809	50.509
9	8.941	62.7	3.26	27.2	34.188	61.388
10	10.192	81.5	4.23	35.2	32.000	67.200
10	10.136	80.6	4.19	34.9	35.000	69.900
10	10.020	78.9	4.10	34.2	41.132	75.332
11	11.000	95.0	4.94	41.2	46.247	87.447
12	12.090	115.0	5.97	49.7	45.000	94.706
12	12.000	113.0	5.87	48.9	50.706	99.600

Above information is quoted from standard authorities. Not guaranteed.

MISCELLANEOUS DATA
Extra Strong Wrought Iron and Steel Pipe
 DIMENSIONS

Pipe Size	External Diameter	Internal Diameter	Thickness	Length of Pipe per Sq. Foot of External Surface in Feet	Length of Pipe per Sq. Foot of Internal Surface in Feet
$\frac{1}{8}$	.405	.215	.095	9.431	17.766
$\frac{1}{4}$	.540	.302	.119	7.073	12.648
$\frac{3}{8}$	.675	.423	.126	5.658	9.030
$\frac{1}{2}$	.840	.546	.147	4.547	6.995
$\frac{3}{4}$	1.050	.742	.154	3.637	5.147
1	1.315	.957	.179	2.904	3.991
$1\frac{1}{4}$	1.660	1.278	.191	2.301	2.988
$1\frac{1}{2}$	1.900	1.500	.200	2.010	2.546
2	2.375	1.939	.218	1.608	1.969
$2\frac{1}{2}$	2.875	2.323	.276	1.328	1.644
3	3.500	2.900	.300	1.091	1.317
$3\frac{1}{2}$	4.000	3.364	.318	.954	1.135
4	4.500	3.826	.337	.848	.998
$4\frac{1}{2}$	5.000	4.290	.355	.763	.890
5	5.563	4.813	.373	.686	.793
6	6.625	5.761	.432	.576	.663
7	7.625	6.625	.500	.500	.576
8	8.625	7.625	.500	.442	.500
9	9.625	8.625	.500	.396	.442
10	10.750	9.750	.500	.355	.391
11	11.750	10.750	.500	.325	.355
12	12.750	11.750	.500	.299	.325

Above information is quoted from standard authorities. Not guaranteed.

MISCELLANEOUS DATA

Double Extra Strong Wrought Iron and Steel Pipe

DIMENSIONS

Pipe Size	External Diameter	Internal Diameter	Thickness	Length of Pipe per Sq. Foot of External Surface in Feet	Length of Pipe per Sq. Foot of Internal Surface in Feet
$\frac{1}{2}$	.840	.252	.294	4.547	15.157
$\frac{3}{4}$	1.050	.434	.308	3.637	8.801
1	1.315	.599	.358	2.904	6.376
$1\frac{1}{4}$	1.660	.896	.382	2.301	4.263
$1\frac{1}{2}$	1.900	1.100	.400	2.010	3.472
2	2.375	1.503	.436	1.608	2.541
$2\frac{1}{2}$	2.875	1.771	.552	1.328	2.156
3	3.500	2.300	.600	1.091	1.660
$3\frac{1}{2}$	4.000	2.728	.636	.954	1.400
4	4.500	3.152	.674	.848	1.211
$4\frac{1}{2}$	5.000	3.580	.710	.763	1.066
5	5.563	4.063	.750	.686	.940
6	6.625	4.897	.864	.576	.780
7	7.625	5.875	.875	.500	.650
8	8.625	6.875	.875	.442	.555

Above information is quoted from standard authorities. Not guaranteed.

MISCELLANEOUS DATA

Properties of Standard Steel Pipe

Pipe Size	External Diam.	Thickness	Weight per Foot	Moment of Inertia I	Section Modulus I/Y	Area of Metal Sq. In. A	Radius of G'tion Squared $R^2 = \frac{I}{A}$	Radius of Gyration R
$\frac{1}{8}$	.405	.068	.244	.001064	.005252	.07199	.01477	.1215
$\frac{1}{4}$	.540	.088	.424	.003312	.01227	.1250	.02651	.1628
$\frac{3}{8}$	.675	.091	.567	.007291	.02160	.1670	.04367	.2090
$\frac{1}{2}$	.840	.109	.850	.01709	.04069	.2503	.06828	.2613
$\frac{3}{4}$	1.050	.113	1.130	.03704	.07055	.3326	.1113	.3337
1	1.315	.133	1.678	.08734	.1328	.4939	.1769	.4205
1 $\frac{1}{4}$	1.660	.140	2.272	.1947	.2346	.6685	.2913	.5397
1 $\frac{1}{2}$	1.900	.145	2.717	.3099	.3262	.7995	.3876	.6226
2	2.375	.154	3.652	.6657	.5606	1.075	.6196	.7871
2 $\frac{1}{2}$	2.875	.203	5.793	1.530	1.064	1.704	.8976	.9474
3	3.500	.216	7.575	3.017	1.724	2.228	1.354	1.164
3 $\frac{1}{2}$	4.000	.226	9.109	4.788	2.394	2.680	1.787	1.337
4	4.500	.237	10.790	7.233	3.214	3.174	2.279	1.510
4 $\frac{1}{2}$	5.000	.247	12.538	10.44	4.177	3.688	2.832	1.683
5	5.563	.258	14.617	15.16	5.451	4.300	3.526	1.878
6	6.625	.280	18.974	28.14	8.496	5.581	5.042	2.245
7	7.625	.301	23.544	46.52	12.20	6.926	6.716	2.592
8	8.625	.277	24.696	63.35	14.69	7.265	8.721	2.953
8	8.625	.322	28.554	72.49	16.81	8.399	8.630	2.938
9	9.625	.342	33.907	107.6	22.35	9.974	10.79	3.284
10	10.750	.279	31.201	125.9	23.42	9.178	13.71	3.703
10	10.750	.307	34.240	137.4	25.57	10.07	13.64	3.694
10	10.750	.365	40.483	160.7	29.90	11.91	13.50	3.674
11	11.750	.375	45.557	217.0	36.93	13.40	16.19	4.024
12	12.750	.330	43.773	248.5	38.97	12.88	19.30	4.393
12	12.750	.375	49.562	279.3	43.82	14.58	19.16	4.377

Above information is quoted from standard authorities. Not guaranteed.

MISCELLANEOUS DATA

Properties of Extra Strong Steel Pipe

Pipe Size	External Diam.	Thickness	Weight per Foot	Moment of Inertia I	Section Modulus I/Y	Area of Metal Sq. In. A	Radius of Gyration Squared $R^2 = \frac{I}{A}$	Radius of Gyration R
$\frac{1}{8}$	.405	.095	.314	.001216	.006004	.09252	.01314	.1146
$\frac{1}{4}$	.540	.119	.535	.003766	.01395	.1574	.02393	.1547
$\frac{3}{8}$	.675	.126	.738	.008619	.02554	.2173	.03966	.1991
$\frac{1}{2}$	.840	.147	1.087	.02008	.04780	.3200	.06273	.2505
$\frac{3}{4}$	1.050	.154	1.473	.04479	.08531	.4335	.1033	.3214
1	1.315	.179	2.171	.1056	.1606	.6388	.1653	.4066
$1\frac{1}{4}$	1.660	.191	2.996	.2418	.2913	.8815	.2743	.5237
$1\frac{1}{2}$	1.900	.200	3.631	.3912	.4118	1.068	.3663	.6052
2	2.375	.218	5.022	.8679	.7309	1.477	.5875	.7665
$2\frac{1}{2}$	2.875	.276	7.661	1.924	1.339	2.254	.8539	.9241
3	3.500	.300	10.252	3.894	2.225	3.016	1.291	1.136
$3\frac{1}{2}$	4.000	.318	12.505	6.280	3.140	3.678	1.707	1.307
4	4.500	.337	14.983	9.610	4.271	4.407	2.181	1.477
$4\frac{1}{2}$	5.000	.355	17.611	14.05	5.621	5.180	2.712	1.647
5	5.563	.375	20.778	20.67	7.431	6.112	3.382	1.839
6	6.625	.432	28.573	40.49	12.22	8.405	4.817	2.195
7	7.625	.500	38.048	71.37	18.72	11.19	6.377	2.525
8	8.625	.500	43.388	105.7	24.51	12.76	8.283	2.878
9	9.625	.500	48.728	149.6	31.09	14.33	10.44	3.231
10	10.750	.500	54.735	212.0	39.43	16.10	13.16	3.628
11	11.750	.500	60.075	280.1	47.68	17.67	15.85	3.981
12	12.750	.500	65.415	361.5	56.71	19.24	18.79	4.335

Above information is quoted from standard authorities. Not guaranteed

MISCELLANEOUS DATA

Safe Loads for Standard Steel Pipe Used as Columns

Calculated as square bearing columns using the formula $P = \frac{45,000}{1 + \frac{(12L)^2}{36,000 R^2}}$

L = Length of column in feet.

R = Radius of gyration in inches.

P = Ultimate strength in lbs. per sq. in.

Factor of safety = 4.

Pipe Size.	Area Sq. in.	Safe Loads in lbs. for different lengths.			
		6	8	10	12
2	1.07	9,775	8,500	7,300	6,250
2½	1.71	16,600	15,000	13,300	11,700
3	2.24	22,800	21,200	19,450	17,700
3½	2.68	28,000	26,400	24,700	22,800
4	3.17	33,800	32,100	30,400	28,500
5	4.32	46,750	45,200	43,600	41,700
6	5.58	61,000	59,800	58,300	56,300
7	6.93	76,200	75,200	73,800	72,000
8	8.39	93,000	92,000	90,250	88,500
10	11.92	133,000	132,000	130,000	128,500
12	14.58	163,000	162,000	160,300	159,000

Above information is quoted from standard authorities. Not guaranteed.

MISCELLANEOUS DATA

*Safe Loads for Extra Strong Steel Pipe
Used as Columns*

Calculated as square bearing columns using the formula $P = \frac{45,000}{1 + \frac{(12L)^2}{36,000 R^2}}$

L = Length of column in feet.

R = Radius of gyration in inches.

P = Ultimate strength in lbs. per sq. in.

Factor of safety = 4.

Pipe Size	Area sq. in.	SAFE LOADS IN LBS. FOR DIFFERENT LENGTHS			
		6	8	10	12
2	1.50	13,500	11,800	10,050	8,530
2½	2.28	22,000	19,750	17,500	15,250
3	3.05	30,900	28,650	26,150	23,750
3½	3.71	38,500	36,150	33,770	31,070
4	4.45	47,000	44,800	42,270	39,600
5	6.12	66,000	64,000	61,450	59,000
6	8.51	93,000	90,750	88,500	85,500

Above information is quoted from standard authorities. Not guaranteed.

MISCELLANEOUS DATA

Square Feet of Surface per Lineal Foot of Pipe

On all lengths over one foot, fractions less than tenths are added to or dropped.

Length of Pipe	SIZE OF PIPE											
	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	4	5	6	7	8
1	.275	.346	.434	.494	.622	.753	.916	1.175	1.455	1.739	1.996	2.257
2	.5	.7	.9	1.	1.2	1.5	1.8	2.4	2.9	3.5	4.	4.5
3	.8	1.	1.3	1.5	1.9	2.3	2.7	3.5	4.4	5.2	6.	6.8
4	1.1	1.4	1.7	2.	2.5	3.	3.6	4.7	5.8	7.	8.	9.
5	1.4	1.7	2.2	2.4	3.1	3.8	4.6	5.8	7.3	7.7	10.	11.3
6	1.6	2.1	2.6	2.9	3.7	4.5	5.5	7.	8.7	10.5	12.	13.5
7	1.9	2.4	3.	3.4	4.4	5.3	6.4	8.2	10.2	12.1	14.	15.8
8	2.2	2.8	3.5	3.9	5.	6.	7.3	9.4	11.6	13.9	16.	18.
9	2.5	3.1	3.9	4.4	5.6	6.8	8.2	10.6	13.1	15.7	18.	20.3
10	2.7	3.5	4.3	4.9	6.2	7.5	9.1	11.8	14.6	17.4	20.	22.6
11	3.	3.8	4.8	5.4	6.8	8.3	10.	12.9	16.	19.1	22.	24.9
12	3.3	4.1	5.2	5.9	7.5	9.	11.	14.1	17.4	20.9	24.	27.1
13	3.6	4.5	5.6	6.4	8.1	9.8	11.9	15.3	18.9	22.6	26.	29.4
14	3.8	4.8	6.1	6.9	8.7	10.5	12.8	16.5	20.3	24.3	28.	31.6
15	4.1	5.2	6.5	7.4	9.3	11.3	13.7	17.6	21.8	26.1	30.	33.9
16	4.4	5.5	6.9	7.9	10.	12.	14.6	18.8	23.2	27.8	32.	36.1
17	4.7	5.9	7.4	8.4	10.6	12.8	15.5	20.	24.7	29.5	34.	38.4
18	5.	6.2	7.8	8.9	11.2	13.5	16.5	21.2	26.2	31.3	36.	40.6
19	5.2	6.6	8.3	9.4	11.8	14.3	17.4	22.3	27.6	33.1	38.	42.9
20	5.5	6.9	8.7	9.9	12.5	15.	18.3	23.5	29.1	34.8	40.	45.2
21	5.8	7.3	9.1	10.4	13.	15.8	19.2	24.7	30.5	36.5	42.	47.4
22	6.	7.6	9.6	10.9	13.7	16.5	20.2	25.9	32.	38.3	44.	49.7
23	6.3	8.	10.	11.3	14.3	17.3	21.1	27.	33.5	40.	46.	52.
24	6.6	8.3	10.4	11.9	14.9	18.	22.	28.2	34.9	41.7	48.	54.2
25	6.9	8.6	10.9	12.3	15.6	18.8	22.9	29.3	36.3	43.5	50.	56.4
26	7.1	9.	11.3	12.8	16.2	19.5	23.8	30.5	37.8	45.2	52.	58.6
27	7.4	9.4	11.7	13.3	16.8	20.3	24.7	31.7	39.3	47.	54.	61.
28	7.7	9.7	12.2	13.8	17.4	21.	25.6	32.9	40.7	48.7	56.	63.2
29	8.	10.	12.6	14.3	18.	21.8	26.6	34.1	42.2	50.4	58.	65.5
30	8.3	10.4	13.	14.8	18.7	22.5	27.5	35.3	43.6	52.1	60.	67.7
31	8.5	10.7	13.5	15.3	19.3	23.3	28.4	36.4	45.1	53.9	62.	70.
32	8.8	11.1	13.9	15.8	19.9	24.1	29.3	37.6	46.5	55.6	64.	72.2
33	9.1	11.4	14.3	16.3	20.5	24.8	30.2	38.8	48.	57.4	66.	74.4
34	9.4	11.7	14.7	16.8	21.2	25.6	31.1	40.	49.5	59.1	68.	76.7
35	9.6	12.1	15.2	17.3	21.8	26.3	32.	41.1	50.9	60.8	70.	79.
36	9.9	12.5	15.6	17.8	22.4	27.	33.	42.3	52.4	62.6	72.	81.3
37	10.2	12.8	16.1	18.3	23.	27.8	33.9	43.5	53.8	64.3	74.	83.5
38	10.5	13.2	16.5	18.8	23.7	28.5	34.8	44.6	55.2	66.	76.	85.8
39	10.7	13.5	16.9	19.3	24.3	29.3	35.7	45.8	56.7	67.8	78.	88.
40	11.	13.8	17.4	19.8	24.9	30.1	36.6	47.	58.2	69.5	80.	90.2
41	11.3	14.2	17.8	20.3	25.5	30.8	37.6	48.2	59.6	71.3	82.	92.5
42	11.5	14.5	18.2	20.8	26.1	31.6	38.5	49.4	61.1	73.	84.	94.8
43	11.8	14.9	18.7	21.3	26.8	32.3	39.4	50.6	62.5	74.8	86.	97.
44	12.1	15.2	19.1	21.8	27.4	33.1	40.3	51.7	64.	76.5	88.	99.3
45	12.4	15.6	19.5	22.2	28.	33.8	41.2	52.9	65.5	78.2	90.	101.6
46	12.7	15.9	20.	22.7	28.6	34.6	42.2	54.	67.	80.	92.	103.8
47	12.9	16.3	20.4	23.2	29.2	35.3	43.	55.2	68.4	81.7	94.	106.
48	13.2	16.6	20.8	23.7	29.9	36.1	43.9	56.4	69.8	83.5	96.	108.4
49	13.5	17.	21.3	24.2	30.5	36.8	44.8	57.6	71.2	85.1	98.	110.5
50	13.8	17.3	21.7	24.7	31.1	37.6	45.8	58.7	72.7	87.	100.	112.8

Note: Above information is quoted from standard authorities. Not guaranteed.

MISCELLANEOUS DATA

Expansion of Steam Pipes

The linear expansion and contraction of pipe, due to differences of temperature of the fluid carried and the surrounding air, must be cared for by suitable expansion joints or bends.

In order to determine the amount of expansion or contraction in a pipe line, we give below a table showing the increase in length of a pipe 100 feet long at various temperatures.

The expansion for any length of pipe may be found by taking the difference in increased length at the minimum and maximum temperatures, dividing by 100 and multiplying by the length in feet of the line under consideration.

EXPANSION OF PIPE
INCREASE IN LENGTH—INCHES PER 100 FEET

Temperature Degrees F.	Steel	Wrought Iron	Cast Iron	Brass and Copper
0	0	0	0	0
20	.15	.15	.10	.25
40	.30	.30	.25	.45
60	.45	.45	.40	.65
80	.60	.60	.55	.90
100	.75	.80	.70	1.15
120	.90	.95	.85	1.40
140	1.10	1.15	1.00	1.65
160	1.25	1.35	1.15	1.90
180	1.45	1.50	1.30	2.15
200	1.60	1.65	1.50	2.40
220	1.80	1.85	1.65	2.65
240	2.00	2.05	1.80	2.90
260	2.15	2.20	1.95	3.15
280	2.35	2.40	2.15	3.45
300	2.50	2.60	2.35	3.75
320	2.70	2.80	2.50	4.05
340	2.90	3.05	2.70	4.35
360	3.05	3.25	2.90	4.65
380	3.25	3.45	3.10	4.95
400	3.45	3.65	3.30	5.25
420	3.70	3.90	3.50	5.60
440	3.95	4.20	3.75	5.95
460	4.20	4.45	4.00	6.30
480	4.45	4.70	4.25	6.65
500	4.70	4.90	4.45	7.05
520	4.95	5.15	4.70	7.45
540	5.20	5.40	4.95	7.85
560	5.45	5.70	5.20	8.25
580	5.70	6.00	5.45	8.65
600	6.00	6.25	5.70	9.05
620	6.30	6.55	5.95	9.50
640	6.55	6.85	6.25	9.95
660	6.90	7.20	6.55	10.40
680	7.20	7.50	6.85	10.95
700	7.50	7.85	7.15	11.40
720	7.80	8.20	7.45	11.90
740	8.20	8.55	7.80	12.40
760	8.55	8.90	8.15	12.95
780	8.95	9.30	8.50	13.50
800	9.30	9.75	8.90	14.10

Above information is quoted from standard authorities. Not guaranteed.

MISCELLANEOUS DATA

Properties of Saturated Steam

Condensed from steam tables and diagrams by Marks & Davis, with the permission of the publishers, Messrs. Longmans, Green & Co.

Vacuum, Inches of Mercury	Temper- ature Fahr.	TOTAL HEAT ABOVE 32° FAHR.		Latent Heat of Evaporation	Volume, Cubic Feet in One Pound of Steam	Weight of One Cubic Foot Steam, Pounds
		Heat Units in the Water	Heat Units in the Steam			
29.74	32.00	0.00	1073.4	1073.4	3294.0	0.000304
29.18	70.00	38.06	1090.3	1052.3	871.0	0.001148
25.85	126.15	94.0	1115.0	1021.0	173.5	0.00576
15.67	176.85	144.7	1136.5	991.8	53.56	0.01867
9.56	193.22	161.1	1143.1	982.0	38.38	0.02606
5.49	201.96	169.9	1146.5	976.6	32.36	0.03090
Lbs. Gauge						
0	212.0	180.0	1150.4	970.4	26.79	0.03732
0.3	213.0	181.0	1150.7	969.7	26.27	0.03806
1.3	216.3	184.4	1152.0	967.6	24.79	0.04042
2.3	219.4	187.5	1153.1	965.6	23.38	0.04277
3.3	222.4	190.5	1154.2	963.7	22.16	0.04512
4.3	225.2	193.4	1155.2	961.8	21.07	0.04746
5.3	228.0	196.1	1156.2	960.0	20.08	0.04980
10.3	240.1	208.4	1160.4	952.0	16.30	0.0614
15.3	250.3	218.8	1163.9	945.1	13.74	0.0728
20.3	259.3	227.9	1166.8	938.9	11.89	0.0841
25.3	267.3	236.1	1169.4	933.3	10.49	0.0953
30.3	274.5	243.4	1171.6	928.2	9.39	0.1065
35.3	281.0	250.1	1173.6	923.5	8.51	0.1175
40.3	287.1	256.3	1175.4	919.0	7.78	0.1285
45.3	292.7	262.1	1177.0	914.9	7.17	0.1394
50.3	298.0	267.5	1178.5	911.0	6.65	0.1503
55.3	302.9	272.6	1179.8	907.2	6.20	0.1612
60.3	307.6	277.4	1181.1	903.7	5.81	0.1721
65.3	312.0	282.0	1182.3	900.3	5.47	0.1829
70.3	316.3	286.3	1183.4	897.1	5.16	0.1937
75.3	320.3	290.5	1184.4	893.9	4.89	0.2044
80.3	324.1	294.5	1185.4	890.9	4.65	0.2151
85.3	327.8	298.3	1186.3	888.0	4.429	0.2258
90.3	331.4	302.0	1187.2	885.2	4.230	0.2365
95.3	334.8	305.5	1188.0	882.5	4.047	0.2472
100.3	338.1	309.0	1188.8	879.8	3.880	0.2577
105.3	341.3	312.3	1189.6	877.2	3.726	0.2683
110.3	344.4	315.5	1190.3	874.7	3.583	0.2791
115.3	347.4	318.6	1191.0	872.3	3.452	0.2897
120.3	350.3	321.7	1191.6	869.9	3.331	0.3002
125.3	353.1	324.6	1192.2	867.6	3.219	0.3107
130.3	355.8	327.4	1192.8	865.4	3.112	0.3213
135.3	358.5	330.2	1193.4	863.2	3.012	0.3320
140.3	361.0	332.9	1194.0	861.0	2.920	0.3425
145.3	363.6	335.6	1194.5	858.8	2.834	0.3529

MISCELLANEOUS DATA

Properties of Saturated Steam

Condensed from steam tables and diagrams by Marks & Davis, with the permission of the publishers, Messrs. Longmans, Green & Co.

Gauge Pressure Pounds Per Square Inch	Temperature Fahr.	TOTAL HEAT ABOVE 32° FAHR.		Latent Heat of Evaporation	Volume, Cubic Feet in One Pound of Steam	Weight of One Cubic Foot Steam, Pounds
		Heat Units in the Water	Heat Units in the Steam			
150.3	366.0	338.2	1195.0	856.8	2.753	0.3633
155.3	368.5	340.7	1195.4	854.7	2.675	0.3738
160.3	370.8	343.2	1195.9	852.7	2.602	0.3843
165.3	373.1	345.6	1196.4	850.8	2.533	0.3948
170.3	375.4	348.0	1196.8	848.8	2.468	0.4052
175.3	377.6	350.4	1197.3	846.9	2.406	0.4157
180.3	379.8	352.7	1197.7	845.0	2.346	0.4262
185.3	381.9	354.9	1198.1	843.2	2.290	0.437
190.3	384.0	357.1	1198.5	841.4	2.237	0.447
195.3	386.0	359.2	1198.8	839.6	2.187	0.457
200.3	388.0	361.4	1199.2	837.9	2.138	0.468
225.3	397.4	371.4	1200.9	829.5	1.924	0.520
250.3	406.2	380.7	1202.3	821.6	1.750	0.571
275.3	414.4	389.4	1203.6	814.2	1.602	0.624
300.3	421.9	397.5	1204.7	807.2	1.479	0.676
305.3	423.4	399.1	1204.9	805.8	1.456	0.687
315.3	426.3	402.2	1205.3	803.1	1.413	0.708
325.3	429.1	405.3	1205.7	800.4	1.372	0.729
335.3	431.9	408.2	1206.1	797.8	1.334	0.750
345.3	434.6	411.2	1206.4	795.3	1.298	0.770
355.3	437.2	414.0	1206.8	792.8	1.264	0.791
365.3	439.8	416.8	1207.1	790.3	1.231	0.812
375.3	442.3	419.5	1207.4	787.9	1.200	0.833
385.3	444.8	422	1208	786	1.17	0.86
400.3	448.5	427.5	1208.5	780	1.10	0.90
435.3	456.5	435	1209	774	1.04	0.96
485.3	467.3	448	1210	762	0.93	1.08
535.3	477.3	459	1210	751	0.83	1.20
585.3	486.6	469	1210	741	0.76	1.32
650.3	497.5	482	1211	729	0.70	1.43
700.3	505.5	491	1211	720	0.65	1.54
750.3	513.5	500	1211	711	0.61	1.64
800.3	521.0	508	1210	702	0.57	1.75
850.3	527.8	516	1209	693	0.53	1.89
900.3	534.4	524	1209	685	0.50	2.00
950.3	540.7	531	1208	677	0.48	2.08
1000.3	546.7	538	1206	668	0.45	2.22
1050.3	552.5	545	1205	660	0.43	2.33
1100.3	558.3	552	1204	652	0.41	2.44
1150.3	563.7	558	1203	645	0.39	2.57
1200.3	569.3	565	1201	636	0.37	2.71

MISCELLANEOUS DATA

Relative Discharging Capacities of Standard Wrought Iron
and Steel Pipes Flowing Full

Calculated for Actual Internal Diameters

Pipe Size.	Inside Dia.	$\sqrt{d^5}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	6	7	8	9	10	11	12
$\frac{1}{32}$	.622	.305	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
$\frac{3}{64}$	.824	.616	2.02	1.81	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1	1.047	1.122	3.68	3.64	2.00	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
$1\frac{1}{4}$	1.38	2.24	7.35	5.34	2.93	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
$1\frac{1}{2}$	1.61	3.29	10.8	10.0	5.48	1.47	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2	2.067	6.15	20.2	15.5	8.52	2.74	1.87	1	1	1	1	1	1	1	1	1	1	1	1	1	1
$2\frac{1}{2}$	2.467	9.56	31.3	26.7	14.7	4.27	2.91	1.56	1	1	1	1	1	1	1	1	1	1	1	1	1
3	3.066	16.46	53.9	45.5	26.7	7.35	5.00	2.68	1.72	1	1	1	1	1	1	1	1	1	1	1	1
$3\frac{1}{2}$	3.548	23.7	77.7	66.5	38.5	10.59	7.20	3.85	2.48	1.44	1	1	1	1	1	1	1	1	1	1	1
4	4.026	32.5	100	87.5	52.8	14.50	9.88	5.28	3.40	1.97	1.37	1	1	1	1	1	1	1	1	1	1
$4\frac{1}{2}$	4.508	43.1	125	110	70.0	19.23	13.10	7.01	4.51	2.62	1.82	1.33	1	1	1	1	1	1	1	1	1
5	5.045	57.1	156	137	92.7	25.5	17.35	9.28	5.98	3.47	2.41	1.76	1.33	1	1	1	1	1	1	1	1
6	6.065	90.5	196	173	125	40.4	27.5	14.7	9.47	5.50	3.82	2.79	2.10	1.58	1	1	1	1	1	1	1
7	7.023	131	245	217	160	58.50	39.8	21.30	13.70	7.96	5.53	4.03	3.04	2.29	1.45	1	1	1	1	1	1
8	7.981	180	302	269	200	80.40	54.70	29.30	18.80	10.90	7.60	5.54	4.18	3.15	1.99	1.38	1	1	1	1	1
9	8.937	238.5	368	330	250	100	72.5	38.8	25.0	14.5	10.1	7.34	5.54	4.18	2.64	1.82	1.33	1	1	1	1
10	10.018	318	447	404	312	125	97.0	51.7	33.3	19.3	13.4	9.79	7.38	5.57	3.52	2.43	1.77	1.34	1	1	1
11	11.	402	539	491	380	156	125	65.3	42.0	24.4	17.0	12.4	9.34	7.04	4.44	3.07	2.23	1.69	1.27	1	1
12	12.	498.8	646	593	460	196	156	81.3	52.3	30.4	21.1	15.4	11.6	8.76	5.52	3.82	2.78	2.10	1.57	1.25	1

This table is based on the well-known hydraulic law that the quantity of water carried by pipes of the same length and smoothness of surface with a given loss of pressure, varies as the square roots of the fifth powers of the diameters. Thus, for example, we may answer the question, "How much water will an eight-inch pipe carry as compared with a six-inch, with the same loss of pressure?" Follow down the first column to 8; then, to the right under column headed 6, we find 1.99, which shows us that an eight-inch pipe will carry 1.99 times as much as a six-inch; or in other words, an eight-inch pipe is about equal to two six-inch pipes.

Above information is quoted from standard authorities. Not guaranteed.

MISCELLANEOUS DATA

**Relative Discharging Capacities of Cast Iron Pipes
Flowing Full**

Adapted from "A Treatise on Hydraulics and Water Supply Engineering"
By J. T. Fanning, C. E.

Diam. of Pipe	$\sqrt{d^5}$	DIAMETER OF PIPE IN INCHES													
		3	4	5	6	8	10	12	14	16	18	20	22	24	30
30	4,929.5	.....	.....	.....	.....	27.09	15.54	9.85	6.54	4.80	3.57	2.74	2.16	1.74	1
24	2,821.8	.....	.....	50.50	32.00	15.58	8.92	5.65	3.84	2.75	2.05	1.57	1.24	1	..
22	2,270.2	.....	70.96	40.65	25.73	12.53	7.17	4.55	3.09	2.16	1.65	1.26	1	.....	..
20	1,788.9	.....	55.96	32.05	20.29	9.88	5.66	3.58	2.43	1.74	1.30	1	.....	.....	..
18	1,374.6	.....	42.01	24.63	15.58	7.25	4.34	2.75	1.87	1.34	1	.....	.....	.....	..
16	1,024.0	65.77	32.01	18.31	11.60	5.65	3.23	2.05	1.39	1	.....	.....	.....	.....	..
14	733.4	47.14	22.94	13.15	8.32	4.05	2.32	1.47	1	.....	.....	.....	.....	.....	..
12	498.8	32.05	15.60	8.93	5.65	2.75	1.57	1	.....	.....	.....	.....	.....	.....	..
10	316.2	20.31	9.88	5.66	3.58	1.74	1	.....	.....	.....	.....	.....	.....	.....	..
8	181.0	11.63	5.66	3.24	2.05	1	.....	.....	.....	.....	.....	.....	.....	.....	..
6	88.18	5.66	2.75	1.58	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	..
5	55.90	3.58	1.75	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	..
4	32.00	2.05	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	..
3	15.59	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	..

NOTE: This table is based on the well known hydraulic law that the quantity of water carried by pipes of the same length and smoothness of surface, with a given loss of pressure, varies as the square roots of the fifth powers of the diameters. Thus for example we may answer the question, "How much water will an eight-inch pipe carry as compared with a six-inch, with the same loss of pressure?" Follow down the first column to 8; then to the right under column headed 6, we find 2.05, which shows us that an eight-inch pipe will carry 2.05 times as much as a six-inch; or, in other words, an eight-inch pipe is a little better than two six-inch pipes.

Above information is quoted from standard authorities. Not guaranteed.

MISCELLANEOUS DATA
Friction Loss in Clean Cast Iron Pipe

Compiled from Weston's "Friction of Water in Pipes" (published by D. Van Nostrand Co., N. Y.) as computed from formulas of Henry Darcy.

Note A—These losses are for new, clean, straight, tarcoated, cast iron pipes. For pipes that have been in service a number of years the losses will be larger on account of corrosion and incrustation, and the losses in the tables should be multiplied under average conditions by the factors given below; but they must be used with much discretion for some waters corrode pipes much more rapidly than others.

10 years	1.3	30 years	2.0
20 years	1.6	50 years	2.6
	75 years	3.4	

The same figures and correction may be used for wrought-iron pipes which are not subject to a frequent change of water.

Note B—The loss of pressure where water enters a pipe from a reservoir is approximately half the head due the velocity in the pipe when the end of pipe is square and flush with the reservoir wall or bottom. If the pipe projects into the reservoir, this loss will then nearly equal the velocity head. If the entrance is funnel shaped, the loss will be practically nothing.

Note C—When gallons per minute and diameter are constant, the friction loss is directly proportional to the length.

Above information is quoted from standard authorities. Not guaranteed.

MISCELLANEOUS DATA

Friction Loss in Clean Cast Iron Pipe

Compiled from Weston's "Friction of Water in Pipes" (published by D. Van Nostrand Co., N. Y.) as computed from formulas of Henry Darcy.

Pounds Loss per 1,000 Feet in Pipe of Given Diameter.

Small Figures give Velocity in Feet per Second.

Figures in () give Cubic Feet per Second. (G. P. M. in U. S. Gallons)

Diam of Pipe.	3	4	5	6	8	10	12	14	16	20	24	30
G p. m.												
250	60	20	6.4	2.5	0.6	0.2	0.07	0.03	0.02	0.01	0.00	....
(0.56)	11.0	6.4	4.0	2.8	1.6	1.2	0.7	0.52	0.4	0.26	0.18	....
500	220	82	25.8	10.0	2.3	0.7	0.29	0.13	0.07	0.02	0.01	0.00
(1.11)	23.0	13.0	8.2	6.0	3.2	2.4	1.4	1.04	0.8	0.51	0.35	0.23
750	477	184	58.0	23.0	5.0	1.6	0.66	0.30	0.15	0.05	0.02	....
(1.67)	34.0	19.0	12.2	8.0	4.8	3.1	2.1	1.56	1.2	0.77	0.53	....
1,000	....	328	103.0	40.0	9.0	2.9	1.20	0.53	0.27	0.09	0.03	0.01
(2.23)	....	26.0	16.3	11.0	6.4	4.1	2.8	2.08	1.6	1.0	0.71	0.45
1,250	....	....	161.0	63.0	14.0	4.6	1.80	0.83	0.42	0.14	0.06	....
(2.79)	....	....	20.4	14.0	8.0	5.1	3.6	2.60	2.0	1.3	0.89	....
1,500	....	....	231.9	91.0	21.0	6.6	2.60	1.10	0.61	0.20	0.08	0.03
(3.34)	....	....	24.5	17.0	10.0	6.1	4.3	3.13	2.4	1.5	1.06	0.68
1,750	....	....	....	123.0	28.0	9.0	3.60	1.6	0.83	0.27	0.11	....
(3.90)	....	....	....	20.0	11.0	7.1	5.0	3.65	2.8	1.8	1.24	....
2,000	....	....	....	160.0	37.0	12.0	4.70	2.14	1.10	0.35	0.14	0.05
(4.46)	....	....	....	23.0	13.0	8.2	5.7	4.17	3.2	2.0	1.42	0.91
2,500	Diam. of Pipe.		....	....	58.0	18.0	7.30	3.34	1.70	0.55	0.22	0.07
(5.57)			....	....	16.0	10.2	7.1	5.21	4.0	2.6	1.80	1.13
3,000	36	48	....	....	....	26.0	10.00	4.81	2.40	0.79	0.32	0.10
(6.68)	....	....	....	....	....	12.0	8.5	6.25	4.8	3.1	2.10	1.40
4,000	....	....	....	....	....	....	....	8.55	4.30	1.40	0.56	0.18
(8.91)	....	....	....	....	....	....	....	8.34	6.4	4.1	2.80	1.80
5,000	0.11	0.03	....	....	....	....	....	....	6.80	2.20	1.00	0.29
(11.14)	1.6	0.89	....	....	....	....	....	....	8.0	5.1	3.60	2.30
6,000	0.16	0.04	....	....	....	....	....	....	....	3.20	1.30	0.41
(13.37)	1.9	1.06	....	....	....	....	....	....	....	6.1	4.3	2.7
7,000	0.23	0.05	....	....	....	....	....	....	....	4.30	1.70	0.56
(15.60)	2.2	1.2	....	....	....	....	....	....	....	7.1	5.0	3.2
8,000	0.29	0.07	....	....	....	....	....	....	....	....	2.20	0.73
(17.82)	2.5	1.4	....	....	....	....	....	....	....	....	5.7	3.6
9,000	0.37	0.09	....	....	....	....	....	....	....	....	2.80	0.92
(20.05)	2.8	1.6	....	....	....	....	....	....	....	....	6.4	4.10
10,000	0.45	0.11	....	....	....	....	....	....	....	....	....	1.13
(22.28)	3.1	1.8	....	....	....	....	....	....	....	....	....	4.5
Vel. ft. per sec.	1	2	3	4	5	6	7	8	9	10	11	12
Hd. due vel ft.	0.016	0.062	0.14	0.25	0.39	0.56	0.76	1.0	1.3	1.6	1.9	2.2
Vel. ft. per sec.	13	14	15	16	17	18	19	20	25	30	40	50
Hd. due vel. ft.	2.6	3.1	3.5	4.0	4.5	5.0	5.6	6.2	9.3	14.0	24.8	38.8

Above information is quoted from standard authorities. Not guaranteed.

MISCELLANEOUS DATA
Equalization of Pipe Areas
 Number of Smaller Pipes Equivalent to One Larger Pipe
 STANDARD STEAM AND GAS PIPES

Dia.	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	6	7	8	9	10	11	12	Dia.
$\frac{1}{2}$		2.27	4.56	10.1	15.6	31.7	52.1	95.3	143.	203.	275.	373.	613.	906.	1280.	1720.	2330.	2980.	3750.	$\frac{1}{2}$
$\frac{3}{4}$	3.27		2.01	4.43	6.88	14.0	23.0	41.9	62.8	88.7	121.	164.	270.	399.	562.	758.	1030.	1310.	1650.	$\frac{3}{4}$
1	7.55	2.31		2.21	3.43	6.96	11.5	20.9	31.3	44.3	60.4	81.8	135.	199.	281.	378.	511.	653.	822.	1
$1\frac{1}{4}$	14.4	4.39	1.90		1.55	3.15	5.17	9.45	14.2	20.0	27.3	37.0	60.8	89.8	127.	170.	231.	295.	372.	$1\frac{1}{4}$
$1\frac{1}{2}$	24.2	7.39	3.21	1.68		2.03	3.34	6.09	9.12	12.9	17.6	23.9	39.2	57.9	81.7	110.	149.	190.	239.	$1\frac{1}{2}$
2	54.8	16.7	7.26	3.81	2.26		1.65	3.00	4.50	6.36	8.68	11.8	19.3	28.6	40.3	54.3	73.4	93.8	118.	2
$2\frac{1}{2}$	102.	31.3	13.6	7.13	4.24	1.87		1.83	2.74	3.87	5.28	7.15	11.7	17.4	24.5	33.0	44.7	57.0	71.8	$2\frac{1}{2}$
3	170.	52.0	22.5	11.8	7.04	3.11	1.66		1.50	2.12	2.89	3.91	6.43	9.50	13.4	18.1	24.5	31.2	39.3	3
$3\frac{1}{2}$	260.	79.6	34.5	18.1	10.8	4.76	2.54	1.53		1.40	1.92	2.61	4.29	6.35	8.95	12.1	16.3	20.8	26.2	$3\frac{1}{2}$
4	376.	115.	49.8	26.1	15.5	6.87	3.66	2.21	1.44		1.36	1.85	3.04	4.49	6.34	8.54	11.5	14.7	18.6	4
$4\frac{1}{2}$	519.	159.	68.8	36.2	21.5	9.50	5.07	3.06	1.99	1.38		1.36	2.23	3.29	4.64	6.26	8.46	10.8	13.6	$4\frac{1}{2}$
5	691.	211.	91.6	48.1	28.6	12.6	6.74	4.07	2.65	1.84	1.33		1.65	2.43	3.43	4.62	6.25	7.98	10.0	5
6	1127.	345.	150.	78.5	46.7	20.6	11.0	6.64	4.33	3.01	2.17	1.63		1.48	2.08	2.81	3.80	4.85	6.11	6
7	1700.	520.	225.	118.	70.4	31.1	16.6	10.0	6.52	4.52	3.27	2.46	1.51		1.41	1.90	2.57	3.28	4.14	7
8	2435.	742.	322.	169.	100.	44.4	23.7	14.3	9.32	6.46	4.67	3.51	2.15	1.43		1.35	1.82	2.33	2.93	8
9	3315.	1015.	440.	231.	137.	60.7	32.4	19.5	12.7	8.84	6.39	4.80	2.94	1.95	1.37		1.35	1.73	2.17	9
10	4383.	1342.	582.	305.	180.	80.2	42.8	25.8	16.8	11.7	8.44	6.34	3.89	2.58	1.80	1.32		1.28	1.61	10
11	5632.	1724.	747.	392.	233.	103.	55.0	33.2	21.6	15.0	10.9	8.15	5.00	3.32	2.32	1.70	1.28		1.26	11
12	7087.	2169.	940.	493.	293.	130.	69.2	41.7	27.2	18.9	13.7	10.3	6.28	4.17	2.92	2.14	1.62	1.26		12
Dia.	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	6	7	8	9	10	11	12	

ACTUAL INTERNAL DIAMETERS.

This table gives the number of pipes of one size required to equal in delivery other larger pipes of same length and under same conditions. The data in the upper right hand triangle pertains to "Standard" steam and gas pipes, while that in the lower triangle is for pipes of the actual internal diameter given. The figure given in the table opposite the intersection of any two sizes is the number of the smaller sized pipes required to equal one of the larger. Thus, it requires about 29 standard 2-inch pipes to equal one standard 7-inch pipe.

Above information is quoted from standard authorities. Not guaranteed.

MISCELLANEOUS DATA

*Capacity of Round Tanks for One Foot in Depth**One Gallon = 231 cubic inches*

Diameter Ft. In.	Area Square Feet	U. S. Gallons	Diameter Ft. In.	Area Square Feet	U. S. Gallons
1-0	.785	5.87	3-4	8.727	65.28
1-1	.922	6.89	3-5	9.168	68.58
1-2	1.069	8.00	3-6	9.621	71.97
1-3	1.227	9.18	3-7	10.085	75.44
1-4	1.396	10.44	3-8	10.559	78.99
1-5	1.576	11.79	3-9	11.045	82.62
1-6	1.767	13.22	3-10	11.541	86.33
1-7	1.969	14.73	3-11	12.048	90.13
1-8	2.182	16.32	4-0	12.566	94.00
1-9	2.405	17.99	4-1	13.095	97.96
1-10	2.640	19.75	4-2	13.635	102.00
1-11	2.885	21.58	4-3	14.186	106.12
2-0	3.142	23.50	4-4	14.748	110.32
2-1	3.409	25.50	4-5	15.321	114.61
2-2	3.687	27.58	4-6	15.90	118.97
2-3	3.976	29.74	4-7	16.50	123.42
2-4	4.276	31.99	4-8	17.10	127.95
2-5	4.587	34.31	4-9	17.72	132.56
2-6	4.909	36.72	4-10	18.35	137.25
2-7	5.241	39.21	4-11	18.99	142.02
2-8	5.585	41.78	5-0	19.63	146.88
2-9	5.940	44.43	5-1	20.29	151.82
2-10	6.305	47.16	5-2	20.97	156.83
2-11	6.681	49.98	5-3	21.65	161.93
3-0	7.069	52.88	5-4	22.34	167.12
3-1	7.467	55.86	5-5	23.04	172.38
3-2	7.876	58.92	5-6	23.76	177.72
3-3	8.296	62.06	5-7	24.48	183.15

Above information is quoted from standard authorities. Not guaranteed.

MISCELLANEOUS DATA

*Capacity of Round Tanks for One Foot in Depth**(Continued)**One Gallon = 231 cubic inches*

Diameter Ft. In.	Area Square Feet	U. S. Gallons	Diameter Ft. In.	Area Square Feet	U. S. Gallons
5-8	25.22	188.66	12	113.10	846.03
5-9	25.97	194.25	12-3	117.86	881.65
5-10	26.73	199.92	12-6	122.72	918.00
5-11	27.49	205.67	12-9	127.68	955.09
6	28.27	211.51	13	132.73	992.91
6-3	30.68	229.50	13-3	137.89	1031.5
6-6	33.18	248.23	13-6	143.14	1070.8
6-9	35.78	267.69	13-9	148.49	1110.8
7	38.48	287.88	14	153.94	1151.5
7-3	41.28	308.81	14-3	159.48	1193.0
7-6	44.18	330.48	14-6	165.13	1235.3
7-9	47.17	352.88	14-9	170.87	1278.2
8	50.27	376.01	15	176.71	1321.9
8-3	53.46	399.88	15-3	182.65	1366.4
8-6	56.75	424.48	15-6	188.69	1411.5
8-9	60.13	449.82	15-9	194.83	1457.4
9	63.62	475.89	16	201.06	1504.1
9-3	67.20	502.70	16-3	207.39	1551.4
9-6	70.88	530.24	16-6	213.82	1599.5
9-9	74.66	558.51	16-9	220.35	1648.4
10	78.54	587.52	17	226.98	1697.9
10-3	82.52	617.26	17-3	233.71	1748.2
10-6	86.59	647.74	17-6	240.53	1799.3
10-9	90.76	678.95	17-9	247.45	1851.1
11	95.03	710.90	18	254.47	1903.6
11-3	99.40	743.58	18-3	261.59	1956.8
11-6	103.87	776.99	18-6	268.80	2010.8
11-9	108.43	811.14	18-9	276.12	2065.5

Above information is taken from standard authorities. Not guaranteed.

MISCELLANEOUS DATA

*Capacity of Round Tanks for One Foot in Depth**(Continued)**One Gallon = 231 cubic inches*

Diameter Ft. In.	Area Square Feet	U. S. Gallons	Diameter Ft. In.	Area Square Feet	U. S. Gallons
19	283.53	2120.9	26	530.93	3971.6
19-3	291.04	2177.1	26-3	541.19	4048.4
19-6	298.65	2234.0	26-6	551.55	4125.9
19-9	306.35	2291.7	26-9	562.00	4204.1
20	314.16	2350.1	27	572.56	4283.0
20-3	322.06	2409.2	27-3	583.21	4362.7
20-6	330.06	2469.1	27-6	593.96	4443.1
20-9	338.16	2529.6	27-9	604.81	4524.3
21	346.36	2591.0	28	615.75	4606.2
21-3	354.66	2653.0	28-3	626.80	4688.8
21-6	363.05	2715.8	28-6	637.94	4772.1
21-9	371.54	2779.3	28-9	649.18	4856.2
22	380.13	2843.6	29	660.52	4941.0
22-3	388.82	2908.6	29-3	671.96	5026.6
22-6	397.61	2974.3	29-6	683.49	5112.9
22-9	406.49	3040.8	29-9	695.13	5199.9
23	415.48	3108.0	30	706.86	5287.7
23-3	424.56	3175.9	30-3	718.69	5376.2
23-6	433.74	3244.6	30-6	730.62	5465.4
23-9	443.01	3314.0	30-9	742.64	5555.4
24	452.39	3384.1	31	754.77	5646.1
24-3	461.86	3455.0	31-3	766.99	5737.5
24-6	471.44	3526.6	31-6	779.31	5829.7
24-9	481.11	3598.9	31-9	791.73	5922.6
25	490.87	3672.0	32	804.25	6016.2
25-3	500.74	3745.8	32-3	816.86	6110.6
25-6	510.71	3820.3	32-6	829.58	6205.7
25-9	520.77	3895.6	32-9	842.39	6301.5

Above information is taken from standard authorities. Not guaranteed.

MISCELLANEOUS DATA

Hydraulic Constants

Pounds of water in one cubic foot	=62.5
Pounds of water in one Imperial gallon	=10.0
Pounds of water in one U.S. gallon	= 8.355
Pounds pressure per square inch due to one atmosphere	=14.7
Pounds per square inch due to one foot of head	= 0.434
Feet of head for pressure of one pound per square inch	= 2.304
Cubic feet in one Imperial gallon	= 0.16
Cubic feet in one U.S. gallon.	= 0.1337
Imperial gallons in one cubic foot	= 6.24
U.S. gallons in one cubic foot	= 7.481
Acceleration of gravity in feet per second per second—g—	=32.16
$\sqrt{2g}$	= 8.020
$\frac{2}{3}\sqrt{2g}$	= 5.347
$\frac{1}{2g}$	=0.01555
$\frac{1}{4}\pi \sqrt{2g}$	= 6.299

*Weight of Water in Pounds Per Cubic Foot
at Different Temperatures Fahr.*

Tem.	Wt.	Tem.	Wt.	Tem.	Wt.	Tem.	Wt.	Tem.	Wt.	Tem.	Wt.	Tem.	Wt.
32	62.42	100	62.02	180	60.55	250	58.81	330	56.24	410	53.26	490	50.03
35	62.42	110	61.89	190	60.32	260	58.52	340	55.88	420	52.86	500	49.61
40	62.42	120	61.74	200	60.07	270	58.21	350	55.52	430	52.47	510	49.20
50	62.41	130	61.56	210	59.82	280	57.90	360	55.16	440	52.07	520	48.78
60	62.37	140	61.37	212	59.71	290	57.59	370	54.79	450	51.66	530	48.36
70	62.31	150	61.18	220	59.64	300	57.26	380	54.41	460	51.26	540	47.94
80	62.23	160	60.98	230	59.37	310	56.93	390	54.03	470	50.85	550	47.52
90	62.13	170	60.77	240	59.10	320	56.58	400	53.64	480	50.44	560	47.10

Above information is quoted from standard authorities. Not guaranteed.

MISCELLANEOUS DATA

Different Pressures and Corresponding Heads of Water

Pressure Lbs. per Sq. In.	Feet Head.	Pressure Lbs. per Sq. In.	Feet Head.	Pressure Lbs. per Sq. In.	Feet Head.
1	2.309	44	101.6	87	200.9
2	4.619	45	103.9	88	203.2
3	6.928	46	106.2	89	205.5
4	9.238	47	108.5	90	207.9
5	11.55	48	110.8	91	210.2
6	13.86	49	113.2	92	212.5
7	16.17	50	115.5	93	214.8
8	18.48	51	117.8	94	217.1
9	20.78	52	120.1	95	219.4
10	23.09	53	122.4	96	221.7
11	25.40	54	124.7	97	224.0
12	27.71	55	127.0	98	226.3
13	30.02	56	129.3	99	228.6
14	32.33	57	131.6	100	230.9
15	34.64	58	133.9	110	254.0
16	36.95	59	136.3	120	277.1
17	39.26	60	138.6	130	300.2
18	41.57	61	140.9	140	323.3
19	43.88	62	143.2	150	346.4
20	46.19	63	145.5	160	369.5
21	48.50	64	147.8	170	392.6
22	50.81	65	150.1	180	415.7
23	53.12	66	152.4	190	438.8
24	55.43	67	154.7	200	461.9
25	57.74	68	157.0	210	485.0
26	60.05	69	159.3	220	508.1
27	62.36	70	161.7	230	531.2
28	64.66	71	164.0	240	554.3
29	66.97	72	166.3	250	577.4
30	69.28	73	168.6	260	600.5
31	71.59	74	170.9	270	623.6
32	73.90	75	173.2	280	646.6
33	76.21	76	175.5	290	669.7
34	78.52	77	177.8	300	692.8
35	80.83	78	180.1	350	808.3
36	83.14	79	182.4	400	923.8
37	85.45	80	184.8	450	1039.
38	87.76	81	187.1	500	1155.
39	90.07	82	189.4	600	1386.
40	92.38	83	191.7	700	1617.
41	94.69	84	194.1	800	1848.
42	97.00	85	196.3	900	2079.
43	99.31	86	198.6	1000	2309.

Above information is quoted from standard authorities. Not guaranteed.

MISCELLANEOUS DATA
Areas and Circumferences of Circles

Diameter	Area	Circumference	Diameter	Area	Circumference
$\frac{1}{8}$	0.0123	.3927	10	78.54	31.41
$\frac{1}{4}$	0.0491	.7854	$10\frac{1}{2}$	86.59	32.98
$\frac{3}{8}$	0.1104	1.178	11	95.03	34.55
$\frac{1}{2}$	0.1963	1.570	$11\frac{1}{2}$	103.86	36.12
$\frac{5}{8}$	0.3068	1.963	12	113.09	37.69
$\frac{3}{4}$	0.4418	2.356	$12\frac{1}{2}$	122.71	39.27
$\frac{7}{8}$	0.6013	2.748	13	132.73	40.84
1	0.7854	3.141	$13\frac{1}{2}$	143.13	42.41
$1\frac{1}{8}$	0.9940	3.534	14	153.93	43.98
$1\frac{1}{4}$	1.227	3.927	$14\frac{1}{2}$	165.13	45.55
$1\frac{3}{8}$	1.484	4.319	15	176.71	47.12
$1\frac{1}{2}$	1.767	4.712	$15\frac{1}{2}$	188.69	48.69
$1\frac{5}{8}$	2.073	5.105	16	201.06	50.26
$1\frac{3}{4}$	2.405	5.497	$16\frac{1}{2}$	213.82	51.83
$1\frac{7}{8}$	2.761	5.890	17	226.98	53.40
2	3.141	6.283	$17\frac{1}{2}$	240.52	54.97
$2\frac{1}{4}$	3.976	7.068	18	254.46	56.54
$2\frac{1}{2}$	4.908	7.854	$18\frac{1}{2}$	268.80	58.11
$2\frac{3}{4}$	5.939	8.639	19	283.52	59.69
3	7.068	9.424	$19\frac{1}{2}$	298.64	61.26
$3\frac{1}{4}$	8.295	10.21	20	314.16	62.83
$3\frac{1}{2}$	9.621	10.99	$20\frac{1}{2}$	330.06	64.40
$3\frac{3}{4}$	11.044	11.78	21	346.36	65.97
4	12.566	12.56	$21\frac{1}{2}$	363.05	67.54
$4\frac{1}{2}$	15.904	14.13	22	380.13	69.11
5	19.635	15.70	$22\frac{1}{2}$	397.60	70.68
$5\frac{1}{2}$	23.758	17.27	23	415.47	72.25
6	28.274	18.84	$23\frac{1}{2}$	433.73	73.82
$6\frac{1}{2}$	33.183	20.42	24	452.39	75.39
7	38.484	21.99	$24\frac{1}{2}$	471.43	76.96
$7\frac{1}{2}$	44.178	23.56	25	490.87	78.54
8	50.265	25.13	26	530.93	81.68
$8\frac{1}{2}$	56.745	26.70	27	572.55	84.82
9	63.617	28.27	28	615.75	87.96
$9\frac{1}{2}$	70.882	29.84	29	660.52	91.10

Above information is quoted from standard authorities. Not guaranteed.

MISCELLANEOUS DATA
Areas and Circumferences of Circles
 (Continued)

Diameter	Area	Circumferences	Diameter	Area	Circumferences
30	706.86	94.24	65	3,318.3	204.2
31	754.76	97.38	66	3,421.2	207.3
32	804.24	100.5	67	3,525.6	210.4
33	855.30	103.6	68	3,631.6	213.6
34	907.92	106.8	69	3,739.2	216.7
35	962.11	109.9	70	3,848.4	219.9
36	1,017.8	113.0	71	3,959.2	223.0
37	1,075.2	116.2	72	4,071.5	226.1
38	1,134.1	119.3	73	4,185.4	229.3
39	1,194.5	122.5	74	4,300.8	232.4
40	1,256.6	125.6	75	4,417.8	235.6
41	1,320.2	128.8	76	4,536.4	238.7
42	1,385.4	131.9	77	4,656.6	241.9
43	1,452.2	135.0	78	4,778.3	245.0
44	1,520.5	138.2	79	4,901.6	248.1
45	1,590.4	141.3	80	5,026.5	251.3
46	1,661.9	144.5	81	5,153.0	254.4
47	1,734.9	147.6	82	5,281.0	257.6
48	1,809.5	150.7	83	5,410.6	260.7
49	1,885.7	153.9	84	5,541.7	263.8
50	1,963.5	157.0	85	5,674.5	267.0
51	2,042.8	160.2	86	5,808.8	270.1
52	2,123.7	163.3	87	5,944.6	273.3
53	2,206.1	166.5	88	6,082.1	276.4
54	2,290.2	169.6	89	6,221.1	279.6
55	2,375.8	172.7	90	6,361.7	282.7
56	2,463.0	175.9	91	6,503.9	285.8
57	2,551.7	179.0	92	6,647.6	289.0
58	2,642.0	182.2	93	6,792.9	292.1
59	2,733.9	185.3	94	6,939.8	295.3
60	2,827.4	188.4	95	7,088.2	298.4
61	2,922.4	191.6	96	7,238.2	301.5
62	3,019.0	194.7	97	7,389.8	304.7
63	3,117.2	197.9	98	7,542.9	307.8
64	3,216.9	201.0	99	7,697.7	311.0

Above information is quoted from standard authorities. Not guaranteed

MISCELLANEOUS DATA

*Mathematical Formulas**The Circle*

The circumference of a circle is equal to the diameter multiplied by 3.1416.

The area of a circle is equal to the square of the diameter multiplied by .7854.

TO FIND THE LENGTH OF AN ARC OF A CIRCLE.—Multiply the diameter of the circle by the number of degrees in the arc and this product by .0087266.

TO FIND THE AREA OF A SECTOR OF A CIRCLE.—Multiply the number of degrees in the arc of the sector by the square of the radius and by .008727; or, multiply the arc of the sector by half its radius.

The Triangle

VARIETIES.—Right angled, having one right angle; obtuse angled, having one obtuse angle; isosceles, having two equal angles and two equal sides; equilateral, having three equal sides and equal angles.

The sum of the three angles of any triangle equals 180 degrees.

The two acute angles of a right angled triangle are complements of each other.

Hypotenuse of a right angled triangle, the side opposite the right angle, equals $\sqrt{\text{sum of the squares of the other two sides}}$.

TO FIND THE AREA OF A TRIANGLE.—Multiply the base by half the height.

THE AREA OF A TRIANGLE BEING GIVEN TO FIND THE LENGTH OF THE BASE.—Base equals twice the area divided by perpendicular height.

AREA OF A TRIANGLE BEING GIVEN TO FIND THE HEIGHT.—Height equals twice area divided by base.

Quadrilateral Figure

TO FIND THE AREA.—Divide the figure into two triangles; the sum of the areas of the triangles is the area.

The Ellipse

TO FIND THE AREA.—Multiply the two diameters together and the product by .7854.

The Sphere

TO COMPUTE THE SURFACE.—Multiply the diameter by the circumference and the product given will give the surface.

TO COMPUTE THE TOTAL VOLUME.—Multiply the cube of the diameter by .5236.

The Cylinder

TO COMPUTE THE SURFACE.—Multiply the length by the circumference and add the product to the area of the two ends.

MISCELLANEOUS DATA

Metric Conversion Table

Millimetres $\times .03937$ = inches.
 Millimetres $\div 25.4$ = inches.
 Centimetres $\times .3937$ = inches.
 Centimetres $\div 2.54$ = inches.
 Metres $\times 39.37$ = inches. (Act of Congress).
 Metres $\times 3.281$ = feet.
 Metres $\times 1.094$ = yards.
 Kilometres $\times .621$ = miles.
 Kilometres $\div 1.6093$ = miles.
 Kilometres $\times 3280.8693$ = feet.
 Square Millimetres $\times .00155$ = sq. inches.
 Square Millimetres $\div 645.1$ = sq. inches.
 Square Centimetres $\times .155$ = sq. inches.
 Square Centimetres $\div 6.451$ = sq. inches.
 Square Metres $\times 10.764$ = sq. feet.
 Square Kilometres $\times 247.1$ = acres.
 Hectare $\times 2.471$ = acres.
 Cubic Centimetres $\div 16.383$ = cubic inches.
 Cubic Centimetres $\div 3.69$ = fl. drams (U.S.P.)
 Cubic Centimetres $\div 29.57$ = fluid ounce (U.S.P.)
 Cubic Metres $\times 35.315$ = cubic feet.
 Cubic Metres $\times 1.308$ = cubic yards.
 Cubic Metres $\times 264.2$ = gallons (231. cubic inches).
 Litres $\times 61.022$ = cu. in. (Act of Congress).
 Litres $\times 33.84$ = fluid ounces (U.S.P.)
 Litres $\times .2642$ = gallons (231. cu. in.)

Litres $\div 3.78$ = gallons (231. cu. in.)
 Litres $\div 28.316$ = cubic feet.
 Hectolitres $\times 3.531$ = cubic feet.
 Hectolitres $\times 2.84$ = bushels (2150.42 cu. inches).
 Hectolitres $\times .131$ = cubic yards.
 Hectolitres $\div 26.42$ = gallons (231. cu. in.)
 Grammes $\times 15.432$ = grains. (Act of Congress).
 Grammes $\div 981.$ = dynes.
 Grammes (water) $\div 29.57$ = fluid ounces.
 Grammes $\div 28.35$ = ounces avoirdupois.
 Grammes per cu. cent. $\div 27.7$ = lbs. per cubic inches.
 Joule $\times .7373$ = foot pounds.
 Kilo-grammes $\times 2.2046$ = pounds.
 Kilo-grammes $\times 35.3$ = oz. avoirdupois.
 Kilo-grammes $\div 907.2$ = tons (2,000 lbs.)
 Kilo-grammes per sq. cent. $\times 14.223$ = lbs. per sq. in.
 Kilo-gram-metres $\times 7.233$ = foot lbs.
 Kilo-gr. per Metre $\times .672$ = lbs. per foot.
 Kilo-gr. per Cu. Metre $\times .062$ = lbs. per cubic feet.
 Tonneau $\times 1.1023$ = tons (2,000 lbs.)
 Kilo-Watts $\times 1.34$ = Horse Power.
 Watts $\div 746.$ = Horse Power.
 Watts $\times .7373$ = foot pounds per second.
 Calorie $\times 3.968$ = B. t. u.
 Cheval vapeur $\div .9863$ = Horse Power.
 (Centigrade $\times 1.8$) $+ 32$ = degree Fahr.
 Gravity Paris = 980.94 centimetres per sec.

MISCELLANEOUS DATA

*Decimal Equivalents**Decimal Equivalents of an Inch*

$\frac{1}{64}$	.01563	$\frac{17}{64}$	.26563	$\frac{33}{64}$	.51563	$\frac{49}{64}$	.76563
$\frac{1}{32}$	.03125	$\frac{9}{32}$	.28125	$\frac{17}{32}$	.53125	$\frac{25}{32}$	.78125
$\frac{3}{64}$	.04688	$\frac{19}{64}$	.29688	$\frac{35}{64}$	.54688	$\frac{51}{64}$	.79688
$\frac{1}{16}$	.0625	$\frac{5}{16}$	.3125	$\frac{9}{16}$	.5625	$\frac{13}{16}$	.8125
$\frac{5}{64}$	.07813	$\frac{21}{64}$	.32813	$\frac{37}{64}$	.57813	$\frac{53}{64}$	.82813
$\frac{3}{32}$	.09375	$\frac{11}{32}$	.34375	$\frac{19}{32}$	.59375	$\frac{27}{32}$	.84375
$\frac{7}{64}$	.10938	$\frac{23}{64}$	.35938	$\frac{39}{64}$	.60938	$\frac{55}{64}$	.85938
$\frac{1}{8}$	.125	$\frac{3}{8}$	.375	$\frac{5}{8}$	.625	$\frac{7}{8}$	.875
$\frac{9}{64}$	.14063	$\frac{25}{64}$	.39063	$\frac{41}{64}$	.64063	$\frac{57}{64}$	.89063
$\frac{5}{32}$	.15625	$\frac{13}{32}$	.40625	$\frac{21}{32}$	.65625	$\frac{29}{32}$	.90625
$\frac{11}{64}$	.17188	$\frac{27}{64}$	.42188	$\frac{43}{64}$	.67188	$\frac{59}{64}$	.92188
$\frac{3}{16}$	.1875	$\frac{7}{16}$	.4375	$\frac{11}{16}$	.6875	$\frac{15}{16}$	.9375
$\frac{13}{64}$	.20313	$\frac{29}{64}$	.45313	$\frac{45}{64}$	.70313	$\frac{61}{64}$	.95313
$\frac{7}{32}$	.21875	$\frac{15}{32}$	.46875	$\frac{23}{32}$	.71875	$\frac{31}{32}$	.96875
$\frac{15}{64}$	.23438	$\frac{31}{64}$	.48438	$\frac{47}{64}$	.73438	$\frac{63}{64}$	.98438
$\frac{1}{4}$	.2500	$\frac{1}{2}$	.5000	$\frac{3}{4}$	.7500	1	1.0000

Decimal Equivalents of a Foot

Inch	0	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$
0	.00	.01	.02	.03	.04	.05	.06	.07
1	.08	.09	.10	.11	.125	.14	.15	.16
2	.17	.18	.19	.20	.21	.22	.23	.24
3	.25	.26	.27	.28	.29	.30	.31	.32
4	.33	.34	.35	.36	.375	.39	.40	.41
5	.42	.43	.44	.45	.46	.47	.48	.49
6	.50	.51	.52	.53	.54	.55	.56	.57
7	.58	.59	.60	.61	.625	.64	.65	.66
8	.67	.68	.69	.70	.71	.72	.73	.74
9	.75	.76	.77	.78	.79	.80	.81	.82
10	.83	.84	.85	.86	.875	.89	.90	.91
11	.92	.93	.94	.95	.96	.97	.98	.99

MISCELLANEOUS DATA

Definitions of Miscellaneous Units

One British thermal unit (B.t.u.) or heat unit = $\frac{1}{180}$ of the heat required to raise 1 lb. of water from 32 deg. to 212 deg. Fahr.

One unit of evaporation (U.E.) = heat required to evaporate 1 lb. of water at 212 deg. into steam at the same temperature = 970.4 B.t.u.

Mechanical equivalent of heat: 1 B.t.u. = 777.54 ft. lb.; or 1 ft.-lb. = .0012861 B.t.u.

One pound (of force) = the force exerted by gravity on 1 lb. of matter where the acceleration due to gravity is 32.1740 ft. per second; that is (very nearly) the force of gravity on 1 lb. of matter at latitude 45° at sea level.

One horsepower = 33,000 ft.-lb. per min. = 550 ft.-lb. per sec.
 = 1,980,000 ft.-lb. per hour.
 = 2,546.5 B.t.u. per hour = 42.44 B.T.u. per min.
 = 745.7 watts = .7457 kilowatt.

One kilowatt = 1000 watts = 1.3410 h.p. = 3,415 B.t.u. per hour.
 = 737.56 ft.-lb. per sec.

One kilowatt-hour = 1.3410 h.p.-hr. = 2,655,200 ft.-lb.

One atmosphere = 760 m.m., or 29.921 in. of mercury at 32 deg. Fahr.
 = 30.011 in. of mercury at 62 deg. Fahr.
 = 14.6963 lbs. per sq. in.

VOLT—The unit of electrical motive force. Force required to send one ampere of current through one ohm of resistance.

OHM—Unit of resistance. The resistance offered to the passage of one ampere, when impelled by one volt.

AMPERE—Unit of current. The current which one volt can send through a resistance of one ohm.

COULOMB—Unit of quantity. Quantity of current which, impelled by one volt, would pass through one ohm in one second.

FARAD—Unit of capacity. A conductor or condenser which will hold one coulomb under the pressure of one volt.

JOULE—Unit of work. The work done by one watt in one second.

WATT—The unit of electrical energy, and is the product of ampere and volt. That is, one ampere of current flowing under a pressure of one volt gives one watt of energy.

One electrical horsepower is equal to 746 watts.

One kilowatt is equal to 1,000 watts.

To find the watts consumed in a given electrical circuit, such as a pump motor, multiply the volts by the amperes.

To find the volts, divide the watts by the amperes.

To find the amperes, divide the watts by the volts.

To find the electrical horsepower required by a motor, divide the watts of the motor by 746.

To find the mechanical horsepower necessary to generate the required electrical horsepower, divide the latter by the efficiency of the generator.

To find the amperes of a given circuit, of which the volts and ohms resistance are known, divide the volts by the ohms.

To find the volts, when the amperes and ohms are known, multiply the amperes by the ohms.

To find the resistance in ohms, when the volts and amperes are known, divide the volts by the amperes.

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481	123	515	365	599	381
482	123	516	365	599	Morrison.....565
483	123	517	365	600	381
484	124	518	Jenkins.....542	600	Lunk.....571
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866	285	932	307	1011	320
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This Catalogue Produced
in Canada from Canadian
Materials for
GRINNELL COMPANY OF CANADA LTD.
by
Southam Press Limited
TORONTO





